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1970 Travel Characteristics

CHICAGO AREA TRANSPORTATION STUDY ADMINISTERED BY ILLINOIS REGIONAL PLANNING COMMISSION

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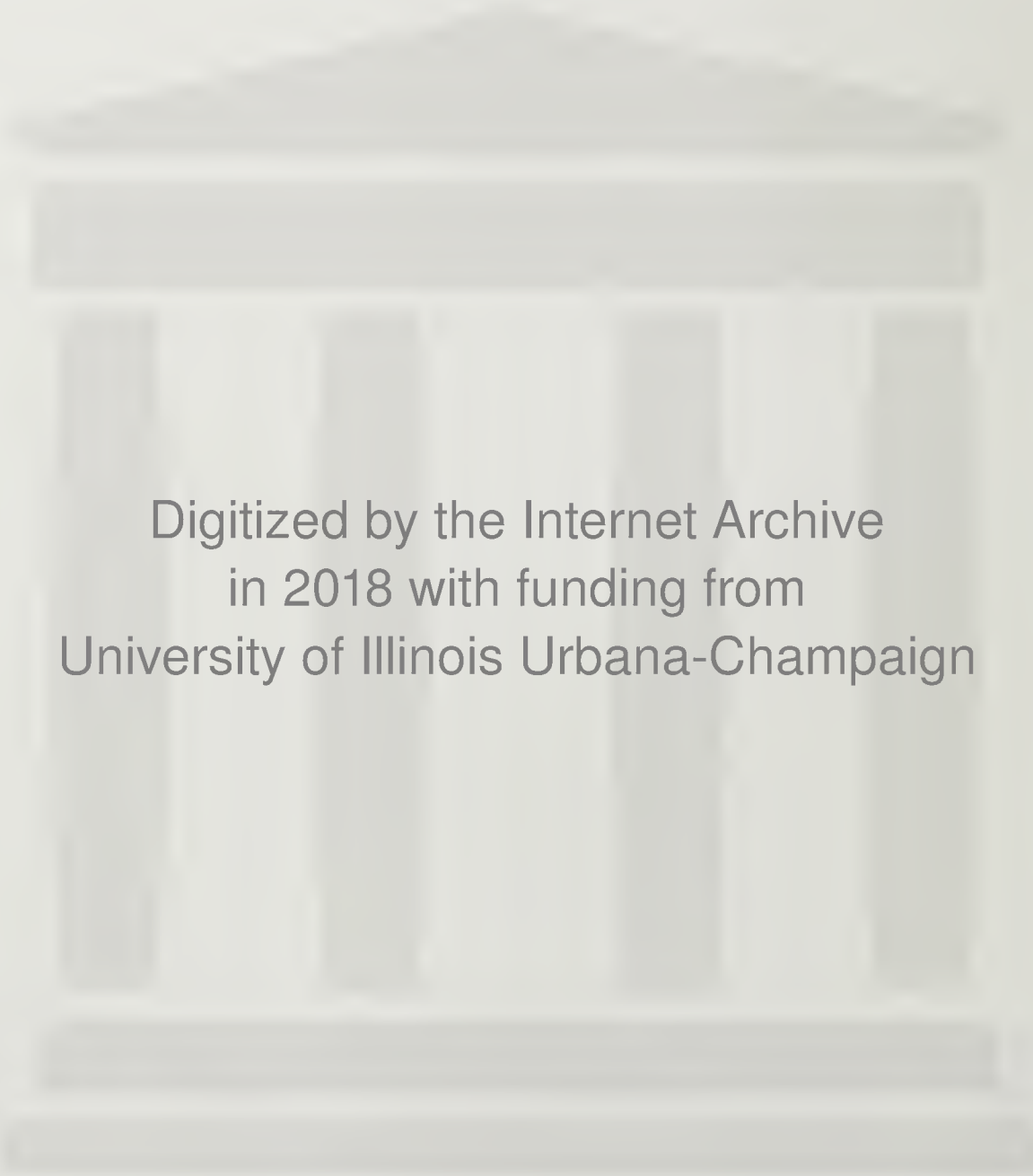
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PREFACE

This report is one in a series of technical reports prepared jointly by the Chicago Area Transportation Study (CATS) and the Northwestern Indiana Regional Planning Commission (NIRPC) for your review and comment. The subject of each of these technical reports represents one section of a final report summarizing the 1970 Travel Characteristics in the Chicago-Northwestern Indiana Region.

The specific reports included in this series are: (1) General Travel Characteristics (mode, purpose, time of day), (2) Trip Generation, (3) Trip Length, (4) Work Travel Analysis of Selected Small Areas, (5) External Travel, (6) Commodities and Commercial Vehicles, and (7) Facilities Supply and Usage. The first six of these reports present the basic findings of the 1970/1971 Chicago-Northwestern Indiana origin-destination (O-D) survey, while the seventh report in the series draws upon the 1973/1974 Chicago-Northwestern Indiana mass transit usage survey, as well as the continuing transportation surveillance program which is part of the eight county Northeastern Illinois-Northwestern Indiana Unified Regional Planning Program. The effects of land use and demographic factors on urban travel are considered throughout the series of reports on 1970 travel characteristics. Land use and selected demographic characteristics of the Region have been analyzed in a separate report prepared by the Northeastern Illinois Planning Commission, entitled, 1970 Land Use - Background to the Year 2000 Transportation Plan.

The Chicago-Northwestern Indiana O-D survey was a joint effort undertaken by the CATS and NIRPC. It covered the Chicago-Northwestern Indiana Standard Consolidated Area, which includes six counties in Illinois (Cook, DuPage, Kane, Lake, McHenry, and Will) and two counties in Indiana (Lake and Porter). The O-D survey included a home interview survey, a commercial vehicle survey, and a cordon line (roadside) survey. Also, a screenline survey was performed to aid in determining the accuracy of the resultant O-D survey travel data. All data from the 1970/1971 O-D surveys are for weekday travel only. The results of the 1970/1971 surveys were compared to the 1956 CATS surveys in order to analyze trends during the last 15 years. However, as the geographic coverage of these two surveys was different, in certain instances adjustments to the data were necessary. These adjustments are described in the appropriate sections.

The Chicago-Northwestern Indiana mass transit usage survey was also a joint effort of the CATS and NIRPC covering the Chicago-Northwestern Indiana Standard Consolidated Area. This survey compiled a file of passenger flow counts on all mass transit facilities (bus, rapid transit, and suburban railroad) in the eight county area. These data were complemented by data from the eight county transportation surveillance program. This program is also maintained by the CATS and NIRPC. The facilities, equipment and performance components of the program were drawn upon.

Your review of this report, and the others in the series, will aid us in obtaining your continuing input in the early stages of the Year 2000 Transportation Planning Process.

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PART I. INTRODUCTION

During 1970 and 1971 surveys were conducted in order to determine the magnitude and nature of travel within the Chicago-Northwestern Indiana Region, which consists of six counties in Illinois (Cook, DuPage, Kane, Lake, McHenry, Will) and two counties in Indiana (Lake and Porter). The Illinois counties were surveyed in 1970, while those in Indiana in 1971. Figure 1 depicts the eight county study area. The surveys were: the home interview survey, the commercial vehicle survey, and the roadside interview (cordon line survey). In addition, a screen line survey was performed to aid in determining the accuracy of the results of the other surveys. The home interview survey, as its name indicates, inventories travel by means of personal interviews conducted at residences within the eight county study area. A systematic sample consisting of every hundredth dwelling place in the Illinois counties and every twentieth dwelling place in the Indiana counties was established, and data were recorded for all occupants, five years of age or older. Sample data were then expanded to represent total weekday travel in the study area. Unless otherwise noted, any reference to 1970 data include the results of both the Illinois and Indiana surveys. The following analysis deals exclusively with expanded home interview (weekday) data which account for over 99 percent of all person trips made to points within the study area.

The purpose of this report is to present the major findings of the 1970 home interview survey with regard to: (1) where person trips were destined, (2) why trips were made, (3) what mode of travel was used, and (4) when trips were made. In addition, results of the 1970 survey will be compared with findings from the home interview travel survey conducted by the Chicago Area Transportation Study (CATS) in 1956, in order to gauge the magnitude and nature of changes in travel patterns over time. The report will first consider the overall magnitude of travel associated with the Chicago-Northwestern Indiana Region in 1970 followed, in order, by sections on purpose of travel, mode of travel, and time distribution of travel. Within each section, comparisons with 1956 travel characteristics will be made.

Person travel in an urban area is generally quantified in terms of numbers of trips and person-miles of travel. In the home interview survey, a person trip was defined as a one-way journey to a destination located outside the block of trip origin by the driver or passenger in an auto or other privately owned vehicles, excluding trucks, or by a passenger in a taxi or mass transit conveyance. Trips made to work were inventoried for all modes, including trucks, walk-to-work and work-at-home. In this analysis, all person trips have been linked. In a linked trip, a person using two or more modes of transportation from origin to destination is considered to be making only one continuous trip. The mode of travel in the linked trip is defined as the mode having the highest priority, with priorities assigned as follows: (1) suburban railroad, (2) rail rapid transit, (3) bus, (4) auto driver, and (5) auto passenger. For example, a trip accessing suburban railroad service by auto and subsequently using public bus to arrive at a final destination would be assigned a priority mode of suburban railroad.

Throughout this report, numbers of trips will be expressed either in terms of weekday trip origins or trip destinations. It was found that during the average 24-hour period, the number of trip origins equals the number of destinations in a given geographic area. This is obviously the case; otherwise some areas would become congested with people and autos, and others would soon become vacant.

The other measure of urban travel, person-miles, is determined from the airline (straight-line) length of each person trip. A person trip which is five miles long produces five person-miles of travel. The length of trips, or person-miles of travel, reflects the impact that trips have on the transportation system. A transportation network can move a certain number of vehicles and people for a given distance during a given period of time. It has the capacity to supply only a limited amount of person-miles of transportation services. Accordingly, as the length of trips increases, either the number of vehicles and people which can be served decreases or the capacity of the transportation system must be increased. Thus, trip-miles of travel determine the required capacity of a transportation system.

As indicated previously, any reference in this report to 1970 findings implies use of 1970/1971 home interview data. As a part of the travel inventory process, this data underwent a series of accuracy checks to insure the validity of its use in the planning process. For further information on these accuracy checks, the reader is referred to Accuracy Checks, Household Characteristics and Travel Patterns, CATS, 1974 and Chicago-Northwestern Indiana Origin-Destination Survey Evaluation, CATS and NIRPC, 1974.

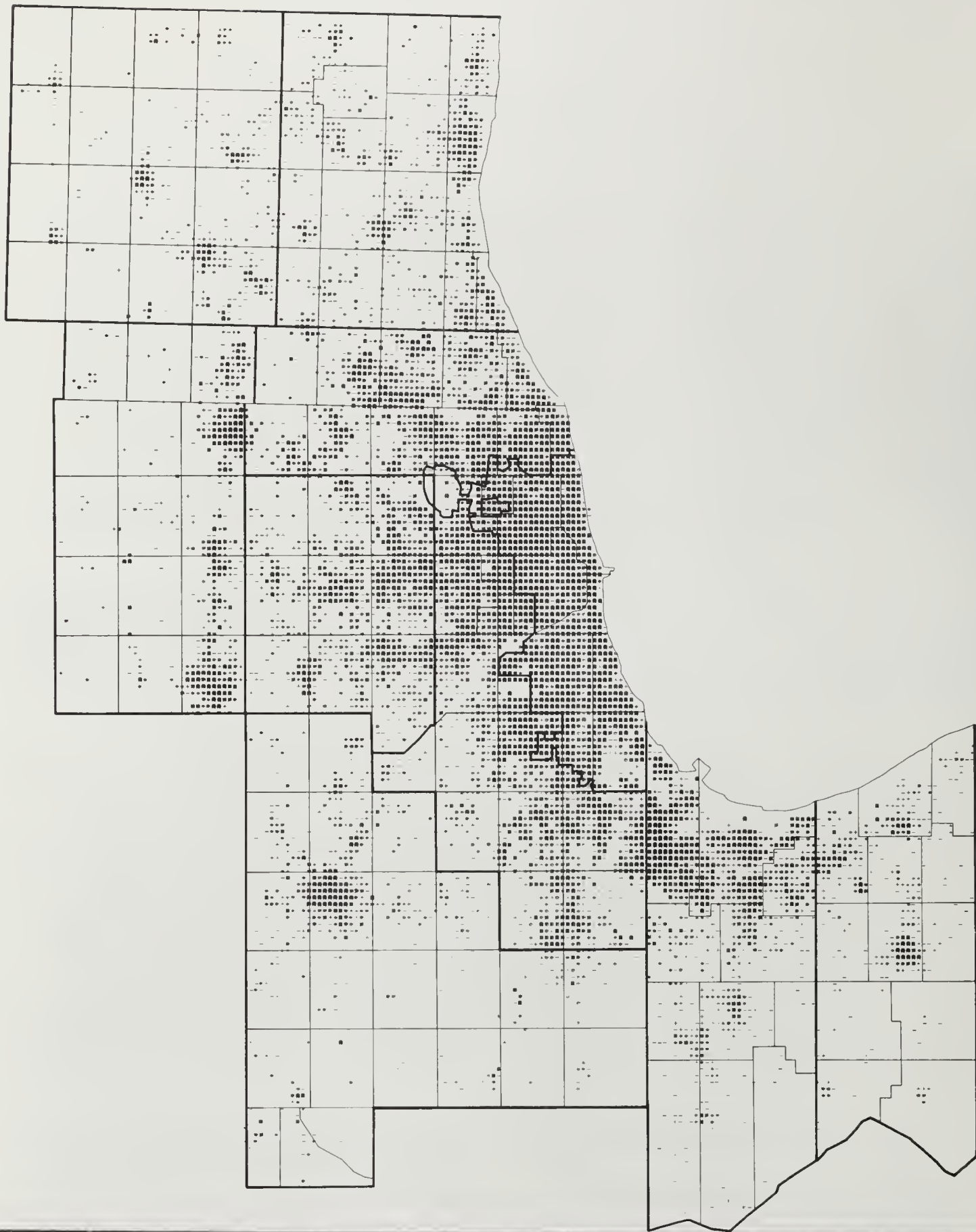
PART II. THE 1970 PERSON TRIPS

On the average weekday in 1970, residents of the eight county region made a total of 18,616,000 linked trips. Figure 2 and Figure 3, which are, respectively, plots of person trip destinations and developed land, show the logical correspondence between the location of trip destinations and the pattern of developed land in the study area. (Developed land includes residential, manufacturing, commercial, public buildings, transportation, utilities, mining and streets.) In terms of both developed land and trip destinations, a more or less continuous mass of activity may be observed along the shore of Lake Michigan in Illinois and Indiana, corresponding to the cities of Chicago, Gary, Hammond, and their nearby suburbs. Arms of development extending from this mass are also apparent in Figure 2 and Figure 3, with considerable development between arms also apparent in both figures. The satellite cities which ring the area are equally recognizable both in terms of trip destinations and developed land.

Figure 2 shows that there is some decrease in the intensity of trip destinations in outer suburban communities, compared to the destination densities in densely developed sections of the region. However, areas with trip destination densities in the upper ranges are apparent in large portions of developed suburban areas and the satellite cities.

Of the total 18,616,000 trips made by residents of the eight county area, 6,190,000 ended within the City of Chicago, 10,482,000 within suburban Illinois, and 1,829,000 within northwestern Indiana. An additional 115,000 trips made by residents ended outside the study area. The Chicago Central Area, bounded by North Avenue, Ashland Avenue, Cermak Road, and Lake Michigan, (ring zero and ring one, see Figure 4) had an extremely high density of trip destinations, with a total of 979,000 trips ending within an area of about 14 square miles. Altogether, trips made by study area residents produced approximately 95.6 million airline miles of travel. In 1956 it was observed that there were 9,931,000 trips internal to the 1956 study area. Approximately 12,950,000 comparable trips were made within the same area in 1970. (The 1956 study area corresponds to ring zero through ring seven in Illinois.) Thus, travel internal to the 1956 study area increased by about 30.5 percent between 1956 and 1970.

Any comparisons of 1956 and 1970 data in this report are based on restricted trip populations. Only those trips with origin, destination and residence within the 1956 study area were drawn from the 1956 and 1970 data sets for comparative analysis. In addition, trip purpose and mode definitions were placed on a common footing. While these restrictions were necessary to compare earlier and current data tabulations, they potentially bias the comparison of 1956 and 1970 data. Since there was a greater degree of development near and outside the boundaries of the 1956 study area in 1970 than in 1956, there probably was a greater occurrence of trip making to external points in 1970 than in 1956 by residents within the 1956 study area. This means that a potentially greater portion of the trips made by residents of the 1956 study area are not being considered in the 1970 data compared to 1956.



6

TRIP DESTINATIONS/
Quarter Square Mile

Under 100

100 to 249

• 250 to 499

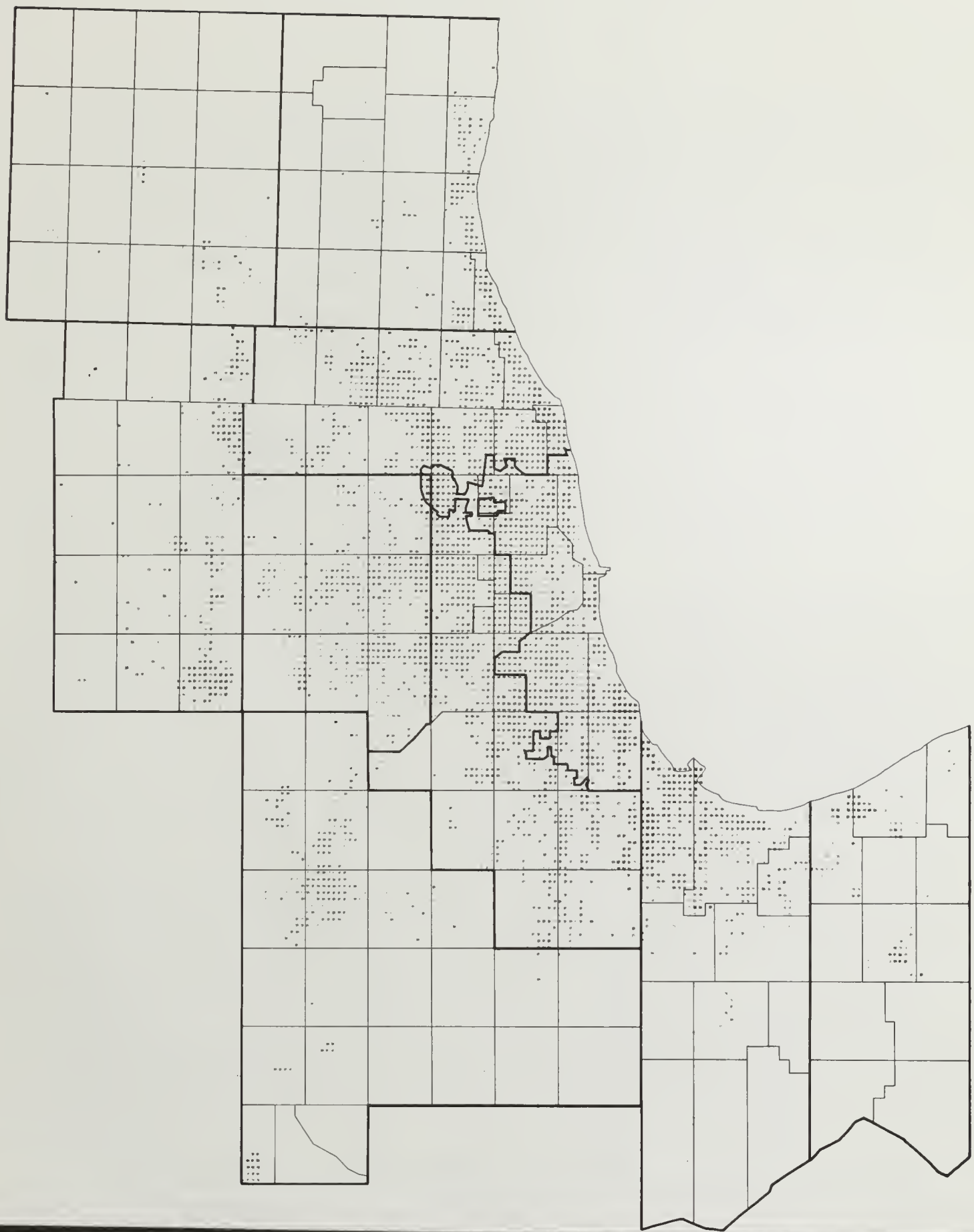
• 500 to 999

• 1000 to 1999

• 2000 to 3999

• 4000 and Over

Figure 2 TOTAL TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



Percent/
Quarter Square Mile

- 0.0 to 14.9
- 15.0 to 29.9
- 30.0 to 44.9
- 45.0 to 59.9
- 60.0 and Over

Figure 3 DEVELOPED LAND IN 1970 STUDY AREA

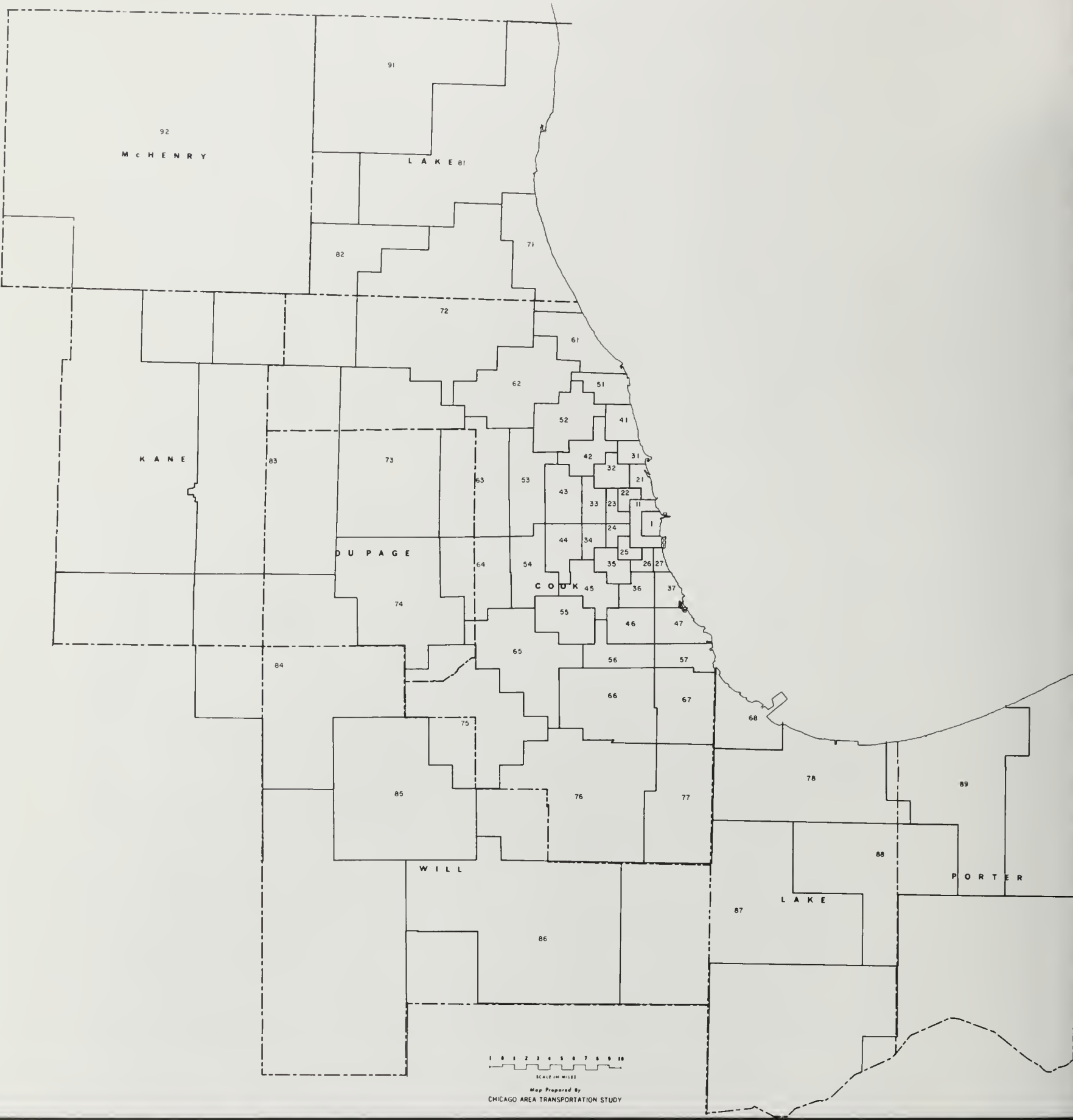


Figure 4 1970 STUDY AREA RINGS AND SECTORS

DISTRICT 75
RING SECTOR

Table 1 lists person trip destinations within each ring and each sector as observed in 1956 and 1970. For this table, trips were summarized into common rings and sectors as defined in the 1956 survey. The 1956 ring/sector divisions had essentially the same structure as those used in the 1970 survey (see Figure 4). Keeping in mind that the data in Table 1 include only trips with origin, destination, and residence within the 1956 study area, it may be observed that the indicated percent of total trip destinations in each ring reflects the outward trend of development in the region. The Chicago Central Area (ring zero and ring one) captured approximately 11.4 percent of all trip destinations in 1956, as opposed to about 7.8 percent of the total trip destinations in 1970. In 1956, rings zero through four, which primarily encompass the City of Chicago, accounted for about 59.6 percent of all trip destinations; while in 1970, 39.4 percent of the trip destinations were located in these rings. Ring five, which corresponds primarily to the suburbs bordering on Chicago, increased its relative portion of trip destinations slightly, with 16.0 percent in 1956, and 17.5 in 1970. The suburban areas in ring six and ring seven nearly doubled their portion of trip destinations jumping from 24.4 percent of the total in 1956, to about 43.1 percent in 1970.

The sector summary listed in Table 1 shows how the more established corridors generally maintained their share of trip destinations, or lost to some degree, while greater growth was experienced in the remaining sectors. For example, the portion of trips ending in the established development corridor along the north shore of Lake Michigan (sector one) basically remained the same, equalling 13.9 percent of the total in 1956 and 14.0 percent in 1970. On the other hand, the rapidly growing northwest suburbs brought about an increase in the portion of trip destinations in sector two and sector three, which had 29.2 percent in 1956 and 34.7 percent in 1970.

In order to complete this overview of 1970 person travel in the eight county area, the connectivity between trip origins and trip destinations also needs to be considered. Table 2 addresses this point by listing the number of trips from each district to every other district in the study area, including itself, during an average, weekday, 24-hour period (see Figure 4 for study area districts). Each cell in the table gives the one-way trip interchange between a given pair of districts. Each row total represents the total trips sent from a given district and each column total represents the trips received by a given district. Thus, the table not only tells how many trips originate or end in each district, but also describes where they are destined or where they came from.

In general, Table 2 is quite symmetrical; i.e., the number of trips from district A to district B is usually very nearly the same as the number from B to A. Similarly, the total number of trips sent by a given district nearly equals the total number received. Thus, Table 2 substantiates the idea of 24 hourly equality between trip origins and destinations, which was expressed earlier.

In Table 2, it may be observed that, with very few exceptions, the trip interchanges along the central diagonal are the highest in each row and column. These cells represent the trips internal to a district and indicate that a given district is generally the greatest attractor of its own trips.

TABLE 1

Trip Destinations by Ring and Sector (Thousands) - 1956 and 1970 Weekday
Person Trips (1956 Study Area Only) (a)

Ring(b)	1956		1970		Sector(b)		1956		1970	
	Trips	Percent	Trips	Percent		Trips	Percent	Trips	Percent	
0	451	4.5	451	3.5	Central Area	1,135	11.4	1,005	7.8	
1	684	6.9	553	4.3	1	1,369	13.9	1,834	14.0	
2	1,007	10.2	742	5.7	2	1,395	14.1	2,451	18.9	
3	1,478	14.9	1,142	8.9	3	1,505	15.1	2,051	15.8	
4	2,293	23.1	2,202	17.0	4	994	10.0	1,367	10.5	
5	1,594	16.0	2,263	17.5	5	637	6.4	1,045	8.2	
6	1,457	14.7	2,823	21.7	6	1,474	14.8	1,980	15.4	
7	967	9.7	2,774	21.4	7	1,422	14.3	1,217	9.4	
TOTAL	9,931	100.0	12,950(c)	100.0	TOTAL	9,931	100.0	12,950(c)	100.0	

(a) Includes only trips with origin, destination and residence inside 1956 study area.

(b) Rings and sectors as defined in 1956 study.

(c) Excludes 102,000 walk-to-work trips, 19,000 work-at-home trips, and 71,000 trips with mode of other. These types of trips were not included in 1956 survey tabulations.

	1	11	21	22	23	24	25	26	27	33	34	35	36	37	38	39	41	42	43	44	45	46	47	48	49	TOTAL
1	193	457	273	57	36	24	20	55	60	17	19	7	1	3	1	4	5	13	0	0	2	0	0	0	1	4885
11	501	755	314	121	127	63	52	53	32	12	16	14	3	5	1	3	11	16	0	2	3	3	0	1	0	5152
21	292	314	432	66	30	23	6	9	7	2	3	5	0	0	0	1	0	4	0	0	3	0	0	0	0	2442
22	58	117	89	148	100	22	9	1	0	3	0	0	0	0	0	0	4	11	0	0	0	0	0	0	0	1113
23	41	110	27	100	119	8	14	5	2	1	1	0	0	0	0	0	2	3	0	0	0	0	0	0	0	932
24	24	52	25	28	6	35	17	0	1	4	3	2	0	1	0	1	0	1	0	0	0	0	0	2	0	710
25	20	59	8	8	15	17	65	34	13	2	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	471
26	47	59	14	1	6	4	34	118	18	0	6	1	0	0	0	0	0	1	0	0	0	0	0	0	0	785
27	48	26	13	0	2	3	15	29	111	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	668
31	170	111	199	32	16	10	1	5	9	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1955
32	142	151	206	88	66	10	1	8	1	2	4	1	0	0	0	0	2	5	0	0	2	0	0	0	0	2548
33	49	100	65	77	73	21	9	14	2	0	0	0	8	0	0	0	0	4	0	0	0	0	0	0	0	1684
34	43	92	18	13	22	39	13	8	6	2	4	1	0	0	0	0	1	2	0	0	0	0	0	0	2	1224
35	46	84	4	19	10	32	25	47	13	1	5	1	0	0	0	0	0	4	0	0	7	0	0	0	0	1695
36	114	140	7	10	7	13	19	45	43	0	0	1	0	2	0	0	0	3	0	0	0	0	0	0	0	1785
37	121	148	26	4	9	33	4	19	129	3	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	1931
41	295	187	43	31	14	17	6	6	9	1	0	2	0	0	0	0	8	5	0	0	1	0	1	0	1	3478
42	149	103	65	45	32	11	1	5	6	13	1	0	0	0	0	0	2	13	0	0	0	0	0	0	0	3460
43	195	164	43	64	57	24	7	17	9	13	4	0	5	1	0	0	6	1	0	0	2	3	0	0	3	4295
44	113	103	6	14	24	52	16	8	6	5	12	1	2	0	0	0	0	11	0	0	0	0	0	0	0	3350
45	86	78	3	6	14	20	26	24	5	0	12	0	0	0	0	0	7	3	0	0	1	4	0	0	0	2819
46	128	110	15	5	5	14	21	13	23	0	3	1	1	1	0	0	6	0	0	0	1	0	0	0	0	2616
47	254	176	22	7	9	16	4	20	65	2	1	0	0	3	0	0	2	0	0	0	1	1	0	0	3	2499
51	86	45	19	7	1	2	0	0	3	3	5	2	0	0	0	0	4	15	5	0	0	0	0	0	2	3083
52	120	82	50	31	30	9	8	11	4	5	0	0	0	0	0	0	20	14	0	0	0	2	0	0	1	4432
53	72	81	31	23	20	15	9	9	8	14	10	3	0	0	0	0	9	12	1	0	0	0	0	0	1	4150
54	42	27	16	0	1	14	4	5	5	1	8	8	0	1	0	0	3	1	0	0	4	0	0	1	0	2287
55	53	60	0	1	4	8	9	18	11	1	3	3	0	0	0	0	0	2	0	0	0	0	0	0	0	2818
56	92	70	14	1	5	12	4	17	15	1	3	1	0	5	0	1	0	4	0	0	1	0	0	0	8	3220
57	61	60	6	0	6	10	7	12	12	0	1	2	0	7	0	1	3	0	0	0	0	0	0	0	2	1383
61	72	36	21	2	2	0	0	4	3	0	1	0	0	0	0	0	6	0	0	0	0	0	0	0	1	2841
62	125	99	32	1	17	9	1	10	6	23	4	3	0	2	0	0	14	18	0	0	1	5	0	2	2	7124
63	10	166	17	7	24	7	8	6	0	98	13	7	0	1	0	1	6	4	2	0	6	0	0	2	3	5695
64	63	60	7	0	3	5	9	4	1	17	17	13	0	0	0	1	19	2	0	0	0	0	2	1	10	3576
65	23	30	2	2	1	2	10	19	10	5	6	8	1	0	0	0	2	2	0	0	3	1	0	1	0	2980
66	152	88	0	4	0	15	4	24	10	0	1	11	0	10	1	0	0	4	0	0	1	0	0	0	4	5888
67	41	33	1	3	1	5	2	3	3	3	2	0	1	23	1	1	3	0	0	0	2	4	2	5	14	2719
68	9	6	1	0	0	1	0	1	0	2	0	0	1	47	17	22	0	0	0	0	0	0	8	3	4	2525
71	55	34	13	3	0	3	0	2	1	0	0	0	0	0	0	0	26	12	0	0	0	0	0	0	1	2762
72	91	72	11	11	7	7	2	5	0	43	8	0	0	0	1	6	57	131	0	0	8	0	0	0	0	7928
73	77	71	4	10	15	5	7	4	3	289	32	8	0	1	0	0	5	26	3	1	10	2	0	0	1	6860
74	40	36	6	0	1	10	2	3	3	66	170	14	0	0	0	0	14	5	1	0	10	0	0	1	7	3705
75	8	7	0	0	0	0	1	2	0	0	22	57	0	2	0	0	1	0	0	0	3	2	0	0	0	680
76	99	51	6	0	2	3	4	10	11	2	12	46	73	105	2	2	14	0	2	0	6	19	1	6	6	6841
77	35	15	1	0	0	1	2	4	0	0	0	6	19	78	6	4	0	0	0	0	0	10	1	7	3	3014
78	28	17	3	0	2	2	3	3	1	1	0	7	1	251	431	370	3	1	1	0	1	2	23	23	46	9828
81	9	12	2	5	0	0	0	1	0	1	1	6	0	0	0	5	272	42	0	0	5	4	0	0	0	6079
82	21	12	0	2	1	0	0	0	0	190	3	0	0	0	0	0	6	171	8	0	5	0	0	0	0	1804
83	18	10	2	4	0	3	2	0	0	918	233	5	0	0	0	0	2	108	34	4	0	14	0	0	2	5166
84	14	23	0	0	0	1	1	6	0	228	3289	175	0	1	0	0	0	12	23	53	46	6	0	0	2	4279
85	4	9	3	0	3	2	0	1	0	3	188	4099	17	0	0	1	3	11	0	0	282	6	0	1	9	4848
86	4	2	0	0	0	0	0	0	0	0	0	14	194	21	0	0	0	0	0	0	11	29	0	0	0	391
87	4	6	0	0	0	2	0	0	0	0	0	0	19	1137	59	9	0	0	0	0	3	2	35	11	4	1839
88	1	4	0	0	0	0	0	0	0	0	0	0	0	60	575	46	0	0	0	0	0	0	4	5	5	1159
89	3	3	1	0	0	2	0	0	0	0	0	1	0	11	46	1689	0	0	0	0	0	0	1	34	263	2667
91	7	12	0	2	2	0	2	0	0	6	1	7	0	0	0	0	1474	87	0	0	0	0	0	0	0	2135
92	9	18	1	7	6	1	1	0	1	113	7	10	0	0	0	0	77	3311	27	0	3	0	0	0	0	4117
93	0	0	0	0	0	0	0	0	0	38	19	0	0	0	0	0	0	23	140	8	1	0	0	0	0	302
94	0	0	0	0	0	0	0	0	0	8	56	0	0	0	0	0	0	0	6	40	1	0	0	0	0	110
95	0	1	2	0	0	0	0	0	0	2	51	271	11	0	0	1	0	0	2	2	630	9	0	0	0	1087
96	0	0	0	0	0	0	0	0	0	12	5	4	27	3	0	0	2	0	0	0	7	22	5	0	1	177
97	0	1	0	0	0	0	0	0	0	0	0	0	0	34	5	2	0	0	0	0	0	3	202	8	1	310
98	0	1	0	0	0	0	0	0	0	0	0	1	0	12	4	33	0	4	0	0	0	0	7	112	15	275
99	2	0	0	0	0	0	0	0	0	2	5	0	0	4	8	264	0	0	0	0	0	0	1	13	252	729
TOTAL	4795	4994	2452	1085	953	669	460	785	658	1183	4273	4829	386	1838	1155	2474	2102	4128	305	110	1075	156	296	240	685	186156

DESTINATION DISTRICTS

[illegible]

ORIGIN DISTRICTS

The portion of internal trips is particularly high for districts containing satellite cities (districts 81, 83, 84, 85 and 78) reflecting their status as more self-contained units. Districts within ring six also have a high level of internal travel (five of eight districts have more than 50 percent internal trips). This may largely be due to the size of the districts in ring six compared to their density of development. These districts are relatively large but contain rather dense development, which results in shorter trips that remain entirely within the district.

As would be expected, the magnitude of interchanges is generally greatest between immediately adjacent districts. In addition, among the districts adjacent to an origin district, interchanges are usually greatest within those districts in the same sector as the origin district. (Interchanges between districts within the same sector are enclosed by the diagonals in Table 2.) Further inspection of Table 2 reveals that for interchanges between other than immediately adjacent districts, the magnitudes of the trips sent from a district is again usually greatest for destination districts within the same sector as the origin district. Thus, while it is apparent from Table 2 that much nonradial travel occurs in the region, particularly for shorter trips, there remains a strong tendency for travel to occur along radial corridors. This is not a surprising discovery, because of the generally radial orientation of the major transportation facilities in the region and the associated development structure engendered by this system.

PART III. PURPOSE OF TRAVEL

Categorizing person trips according to the purpose for which the trip was made has been found to be an effective aid in the understanding of urban travel and has been incorporated into many travel forecasting techniques. In the home interview survey, a purpose from and a purpose to was recorded for each reported trip. For example, typical home based work travel would have a purpose from home and to work in the morning and purpose from work and to home in the evening. For any given trip purpose, the total number of trips with purpose to should essentially equal the number with purpose from, during an average weekday. However, because total trips had to be determined by factoring the survey sample, some imbalance with respect to purpose may exist.

Table 3 summarizes 1970 person trips made by residents of the eight county area according to purpose at the origin (purpose from) and purpose at the destination (purpose to). Most trips are home based, with 83.2 percent of all person trips either beginning or terminating at home. The major reason for traveling from home is to get to work. About 32.1 percent of all trips from home have a purpose to work. Other important purposes of travel from home are shopping and social/recreational activities, which constitute 18.9 percent and 20.8 percent, respectively. Trips from home to school and for personal business are also important, representing 8.5 percent and 10.7 percent of the total trips from home.

Table 4 compares person trips by purpose from the 1970 and 1956 home interview surveys. For comparative analysis, the different purpose groupings of the 1956 and 1970 surveys were placed on a common basis. The relative occurrence of trips to home remained constant, with 43.5 percent of all trips having a purpose to home in both 1956 and 1970. Trips to work decreased in relative frequency, dropping from 20.4 percent of the total in 1956 to 18.5 percent in 1970. Trips with nonwork purposes, other than to home, increased in importance, constituting 36.1 percent of all trips in 1956 compared to 38.0 percent in 1970. Apparently the increased standard of living from 1956 to 1970 has enabled trip makers to devote a greater portion of their total travel budget to nonwork travel.

Because of possible differences in the interpretation of nonwork trip purposes between surveys, comparisons of 1956 and 1970 trips with a specific nonwork purpose should be approached with considerable caution. However, such a comparison may reveal some general trip purpose trends. Among the nonwork trip purposes, shopping trips exhibited the greatest change in relative importance between 1956 and 1970. In 1970, trips with purpose to shop constituted 12.6 percent of all trips, while in 1956 they amounted to only 5.5 percent of the total. A higher level of disposable income has allowed individuals to increase shopping activities, while increased auto orientation of shopping facilities, along with increased auto ownership, has made it easier to make shopping trips. Accordingly, more shopping trips are being made, and many of the shopping trips that were formerly accomplished by walking (which would not be included in the survey) are being made by auto.

TABLE 3

Trips by Trip Purpose at Origin and Trip Purpose at Destination (Thousands) - 1970
Weekday Person Trips

Purpose At Origin	Purpose at Destination									
	Home	Work(a)	Business Related To Work	Shop	School	Social- Recrea- tional	Personal Business	Serve Passenger	Other	TOTAL
Home	2	2,429	149	1,432	642	1,582	809	525	7	7,577
Work	2,132	35	141	105	11	172	82	4	6	2,688
Business Related To Work	183	104	254	12	1	32	9	1	1	597
Shop	1,664	21	4	394	2	180	84	6	1	2,356
School	710	17	0	16	5	27	17	0	0	792
Social- Recrea- tional	1,928	112	23	170	20	430	68	19	1	2,761
Personal Business	746	44	7	188	6	116	151	4	1	1,263
Serve Passenger	527	4	1	6	1	20	4	0	0	563
Other	12	4	1	1	0	1	0	0	0	19
TOTAL	7,904	2,770	580	2,324	678	2,560	1,224	559	17	18,616

(a) Includes 145,000 walk-to-work and work-at-home trips.

TABLE 4

Trips by Trip Purpose (Thousands) - 1956 and 1970 Weekday Persons Trips
(1956 Study Area Only) (a)

Trip Purpose To	<u>1956</u>		<u>1970</u>	
	Trips	Percent	Trips	Percent
Home	4,319	43.5	5,621	43.5
Work	2,033	20.4	2,378	18.5
Shop	547	5.5	1,643	12.6
School	193	1.9	472	3.6
Social/ Recreational	1,476	14.9	1,598	12.3
Personal Business	1,022	10.3	839	6.5
Other	341	3.5	399	3.0
TOTAL	9,931	100.0	12,950(b)	100.0

(a) Includes only trips with origin, destination, and residence inside the 1956 study area.

(b) Excludes 102,000 walk-to-work trips, 19,000 work-at-home trips, and 71,000 trips with mode of other. These types of trips were not included in 1956 survey tabulations.

It is possible that some of the additional shopping trips in 1970 were actually made for other purposes, but were reported as shopping trips by interview respondents, because they were made to shopping centers. This may account in part, for the decline in relative frequency of personal business trips. Trips of this purpose constituted 10.3 percent of the total in 1956, but dropped to only 6.4 percent of the total in 1970. Some of this decline may also be traceable to the greater use of the mail and telephone for conducting certain types of personal business.

As Table 4 shows, there was a rather large increase in the portion of trips with purpose to school. The primary factor in this change was probably the increased use of school buses, which accompanied the growth of development in suburban areas.

The purpose for which a trip is made, obviously, is closely related to the land use at the trip destination. For example, 85 percent of the trips to manufacturing areas had a purpose to work and 60 percent of the trips to land occupied by trade activities had a purpose to shop. Figure 5 through Figure 12 help show the connection between purpose of travel and the pattern of land use in the region. These maps plot trip destinations per quarter-square mile for major trip purposes recorded in the home interview survey.

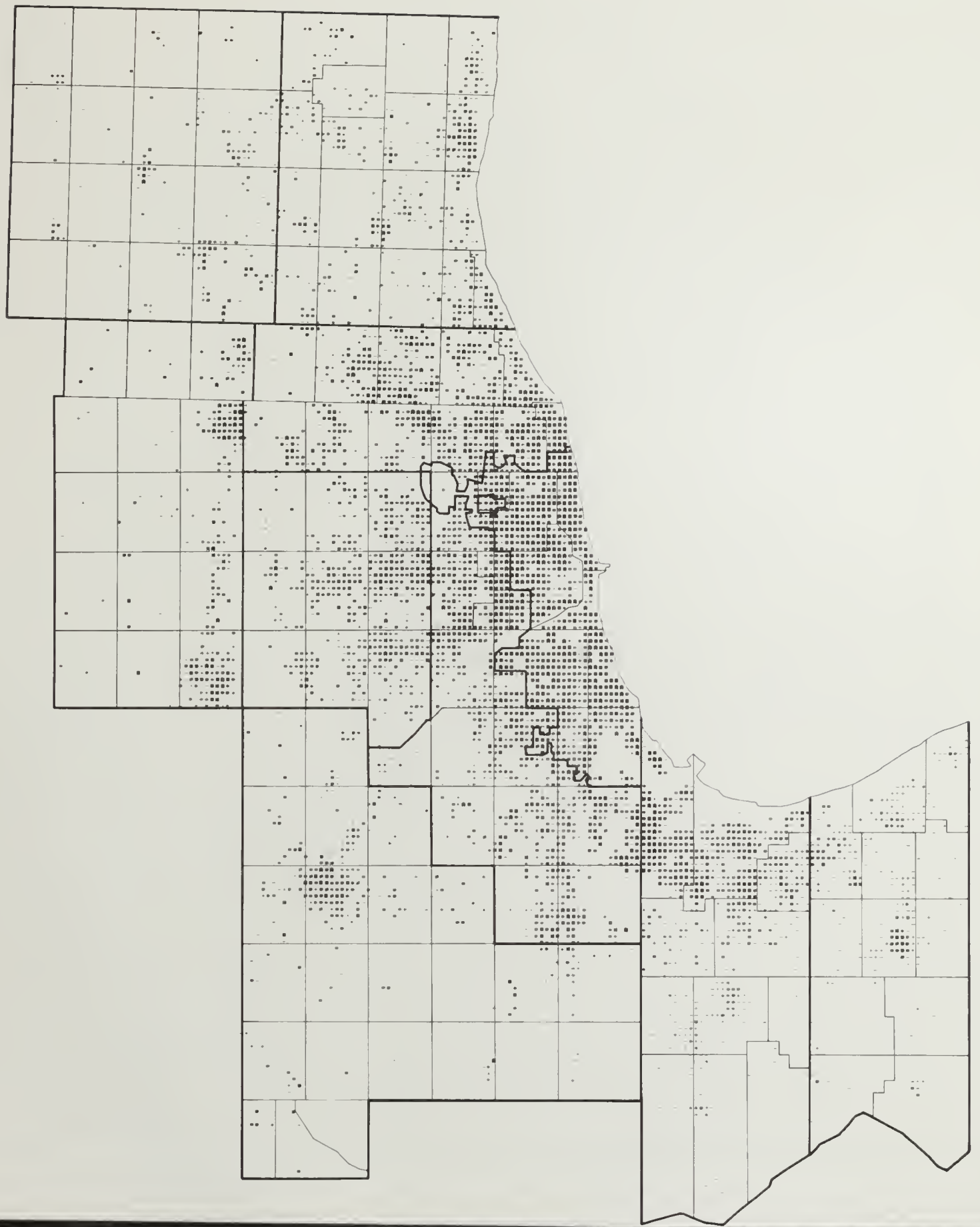
Figure 5 shows trip destinations with a purpose to home. The pattern of these trips outline, essentially, the entire developed area of the region. Notable "holes" in the pattern correspond to areas where residential development is minimal. For example, in the suburbs, forest preserve areas surrounded by residential development stand out as "islands", while in the City of Chicago and in the Gary-Hammond area large industrial and commercial areas are highly apparent. The lack of residential development in the industrial area extending southwest along the Sanitary and Ship Canal, in the commercial and industrial areas directly west of the Loop, and in the industrial area along the Indiana shoreline is highly noticeable.

Figure 6 is a plot of work trip destinations in the study area. The gaps corresponding to industrial and commercial development in the plot of trips to home are no longer visible. Work trips to the west and southwest commercial and industrial areas in Chicago, and to the industrial areas in northwestern Indiana, have filled in much of these formerly blank areas. At the same time, suburban areas which had heavy concentrations of trips to home have a lower density of trips to work. As Figure 6 shows, work trip destinations are at a high level throughout Chicago and much of the Gary-Hammond area, but tend to decrease in the nearby suburbs. Except for the satellite cities and scattered points of concentrated employment, most of the suburban area has a lower density of work trip destinations.

Figure 7 shows the distribution of shopping trip destinations. Shopping trips destinations largely exhibit a nodular and strip configuration, corresponding with commercial strips and shopping center developments. Personal business trip destinations, shown in Figure 8, have somewhat of a nodular structure similar to shopping trips. On the other hand, social/recreational trip destinations exhibit rather uniform densities throughout the developed areas in the region, as shown in Figure 9.

The destinations of trips performed to transact business related to work are shown in Figure 10. These trips show a tendency to cluster at regional and subregional centers such as the Chicago Central Area and the Central Business Districts (CBD's) of satellite cities. The pattern of trips to school, shown in Figure 11, locates those institutions which attract at least 100 students to the quarter-square mile in which they are located. Since walking trips to school were not surveyed, those schools with a high percentage of students who walk tend to receive less emphasis or may not appear at all.

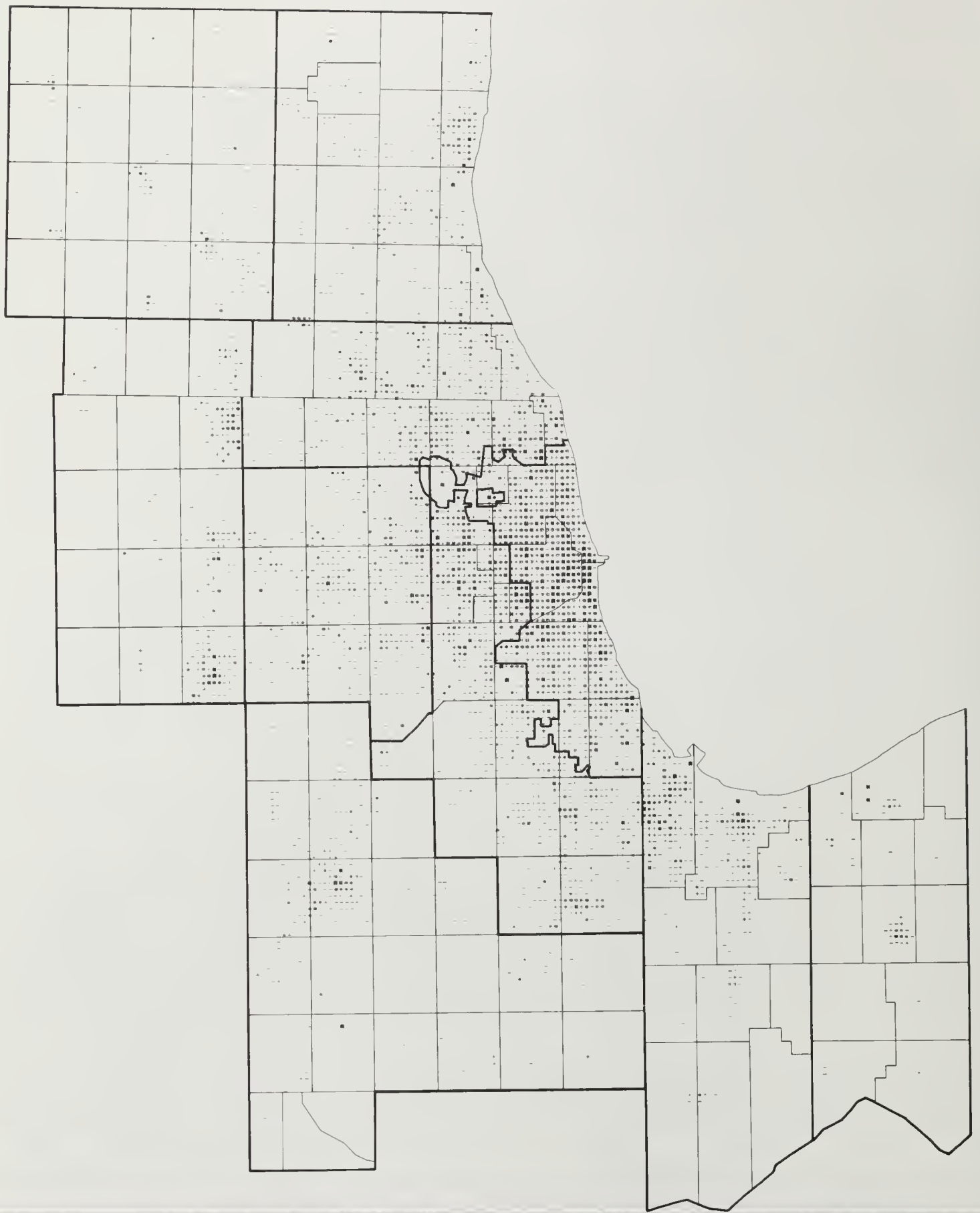
Finally, Figure 12 plots the destinations of trips made for the purpose of serving a passenger. The pattern of these trips is obviously related to levels of auto ownership and usage, as shown by the relatively lower densities of these trips within the City of Chicago.



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure 5 HOME TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS

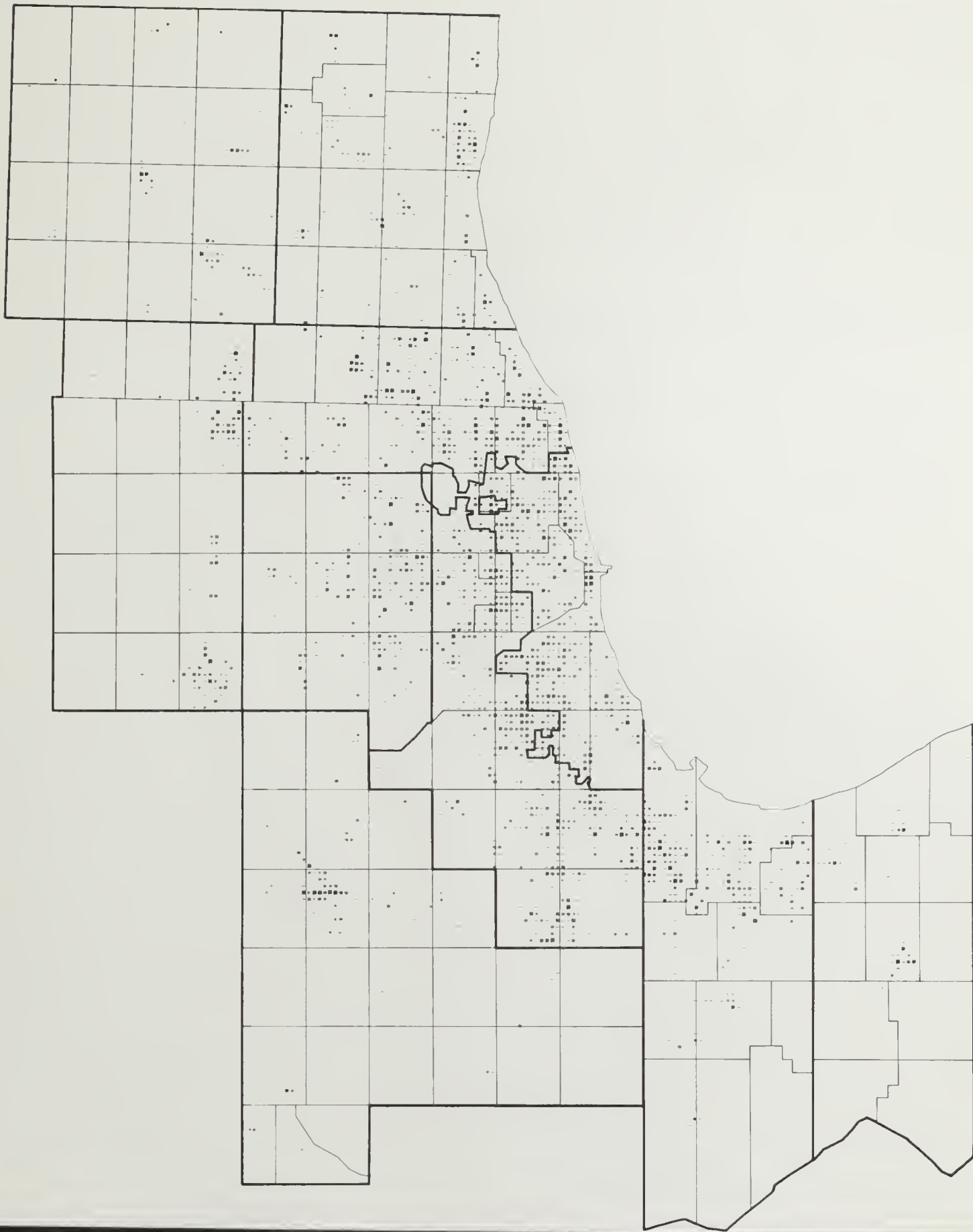


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TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

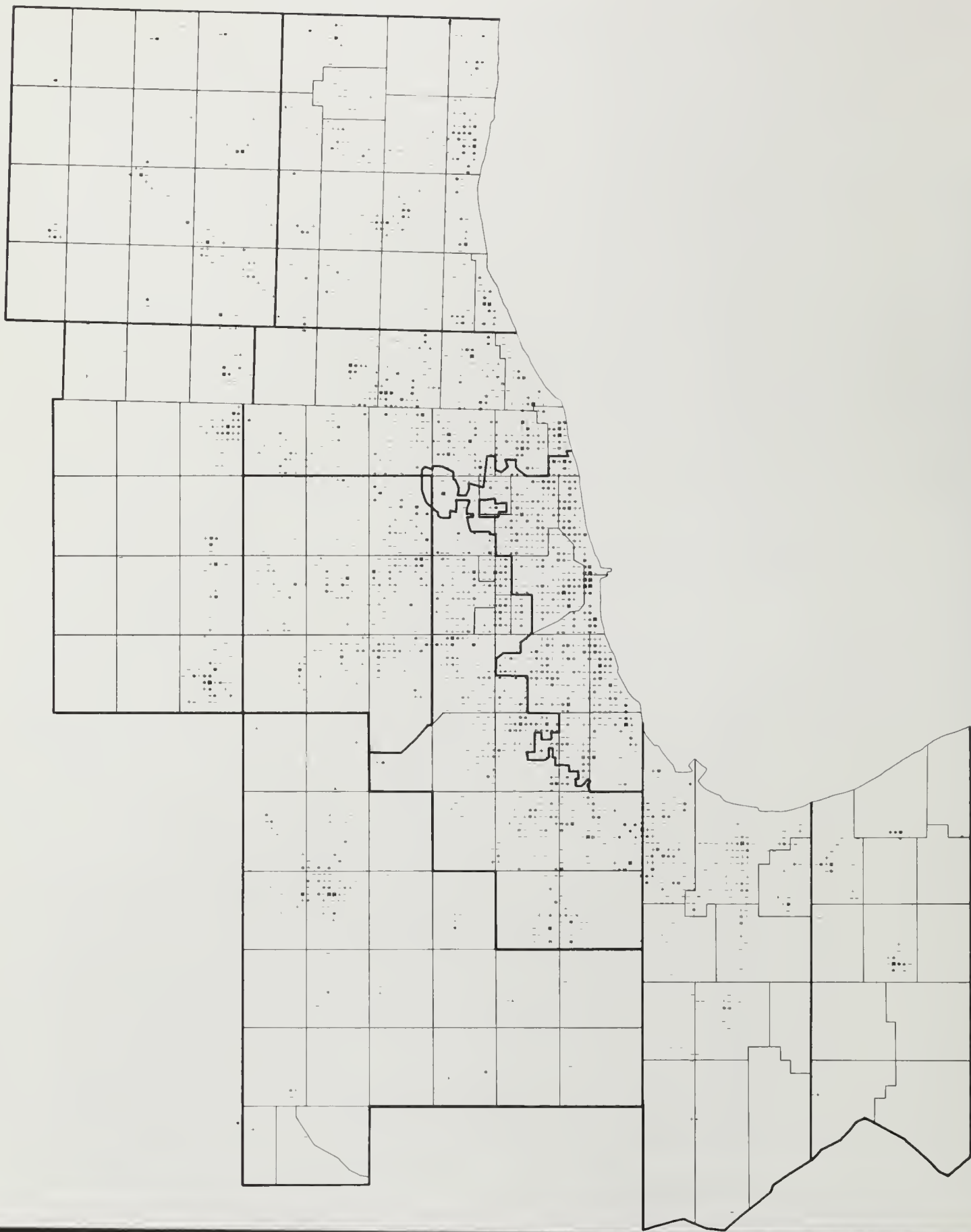
Figure 6 WORK TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

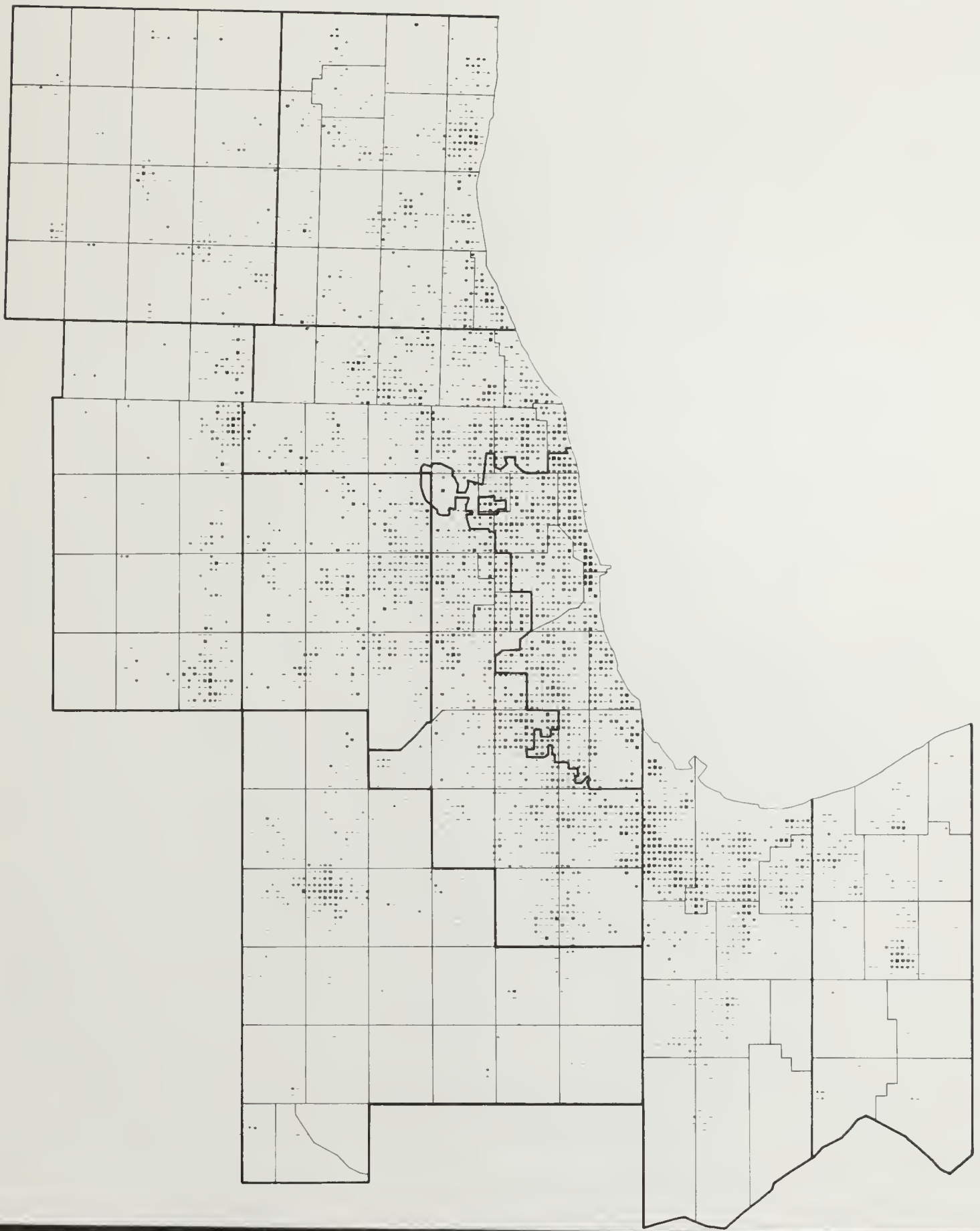
Figure 7 SHOPPING TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

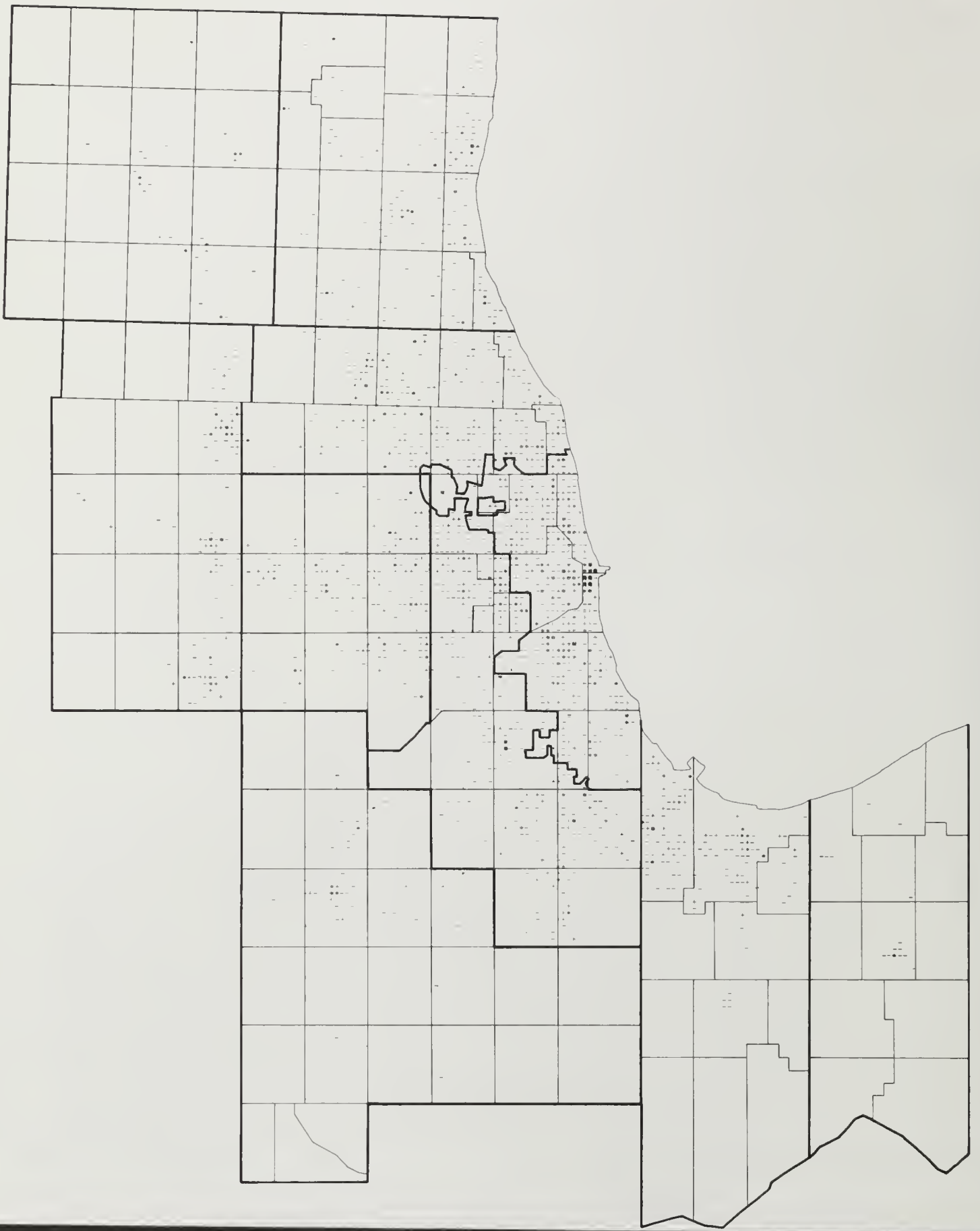
Figure 8 PERSONAL BUSINESS TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

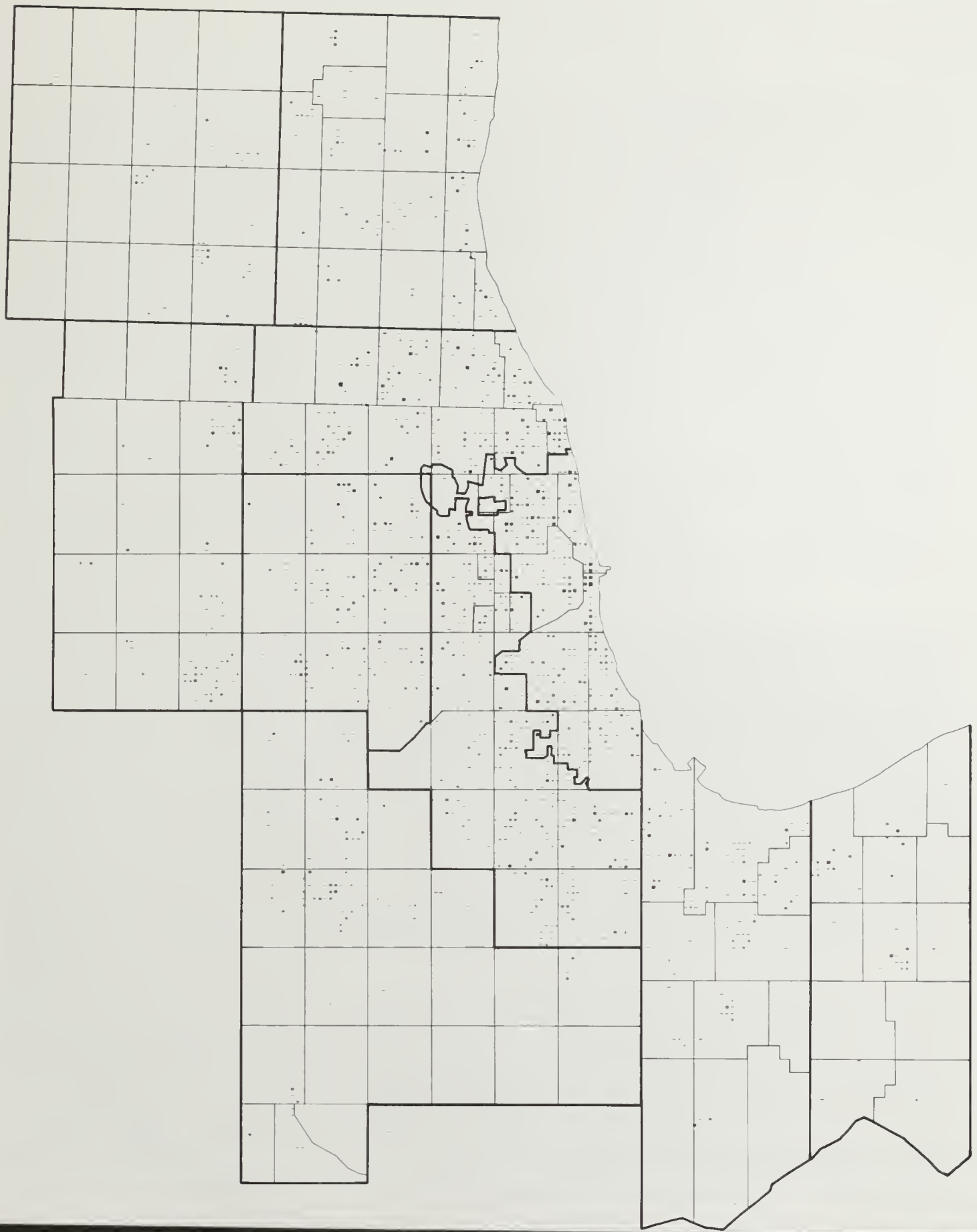
Figure 9 SOCIAL/RECREATIONAL TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure 10 BUSINESS RELATED TO WORK TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS

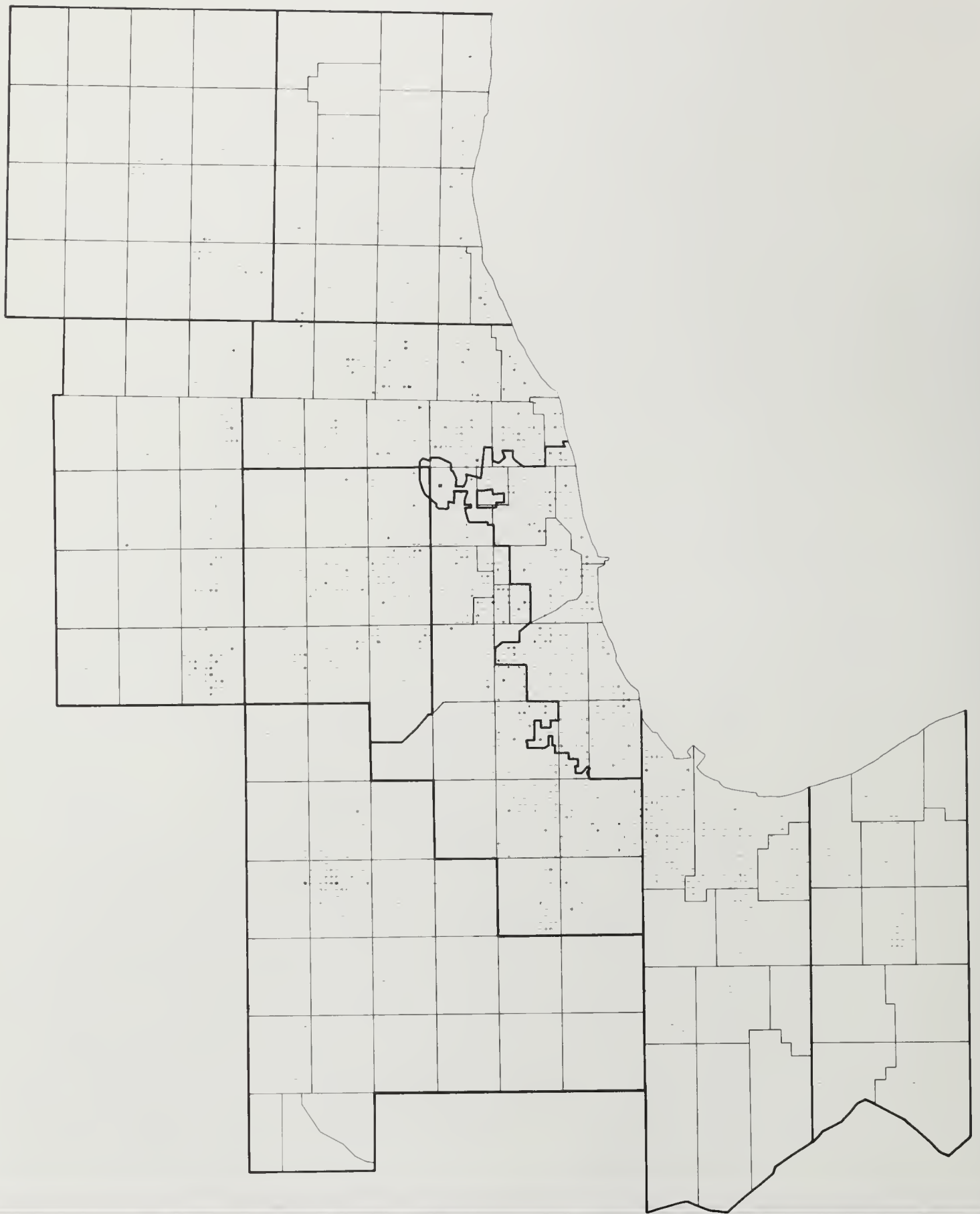


25

TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure II SCHOOL TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure 12 SERVE PASSENGER TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS

Table 5 summarizes numbers of trips and their relative frequency of occurrence according to purpose for selected portions of the region. As Table 5 shows, in the Chicago Central Area work trips dominate, with 53.0 percent of all trip destinations in this area having a purpose to work. Relative to the rest of the region, the remainder of the City of Chicago has a rather high level of work trip destinations, with 17.2 percent of all trips having a purpose to work. In suburban Illinois and northwestern Indiana only 10.9 percent and 11.1 percent, respectively, of the trip destinations have a purpose to work. In contrast, shopping trips constitute 14.5 percent of all trip destinations in suburban Illinois, while only 9.6 percent of all trips in Chicago, excluding the Chicago Central Area, have a purpose to shop. The apparently low level of shopping trips to the Chicago Central Area, 6.1 percent, can probably be traced, in part, to secondary walking trips made for the purpose of shopping. Such trips made by individuals traveling to the Chicago Central Area with another primary purpose, such as work, were not recorded in the survey. Social/recreational trips appear to be more prevalent in northwestern Indiana than in other areas, with 20.6 percent of all trips with this purpose compared to a regional average of 13.8 percent. Recreational trips to Indiana from other parts of the region may be a factor in this higher rate.

In addition to varying by location in the region, the relative frequency of trips by purpose varies according to household income of the trip makers. In the 1970 home interview survey, income information was obtained for approximately 85 percent of the reported trips. For this analysis, household incomes were classified into four major groups: (1) \$6,000 or less, (2) \$6,001 to \$9,000, (3) \$9,001 to \$14,000, and (4) \$14,001 or more. Table 6 shows the percent of total trips made for each trip purpose by each income group. The percentage of work trips increases from 13.5 percent for households with income below \$6,000 to 17.1 percent for households with income between \$6,001 to \$9,000. The portion of work trips then drops to 15.0 percent and 13.8 percent, respectively, for the next two higher income groups. Since households in the higher income groups generally have more resources available to devote to nonessential needs, it is reasonable that work trips represent a smaller portion of total trips as income increases.

However, households with incomes less than \$6,000 do not appear to fit into this general pattern, with a percent of work trips even less than that of households with income over \$14,000. One cause of the lower portion of work trips in the income group below \$6,000 is the lower ratio of employed to unemployed individuals within this income group. Households in the group with an annual income below \$6,000 include large numbers of retirees, unemployed individuals, and welfare families, which would make for a lower ratio of workers to non-workers and result in a smaller percentage of work trips.

To this point, purpose of travel has been quantified in terms of numbers of trips made. Also of interest are the person-miles of travel which are generated by these trips. As Table 7 shows, relative to their number, trips to work have a great impact, producing 19.4 percent of all person-miles of travel, while constituting only 14.9 percent of the total trips made. With an average length of 7.0 miles, work trips tend to be longer than trips with nonwork purposes. This greater length, along with the concentration

Table 5
Trips by Trip Purpose and Location of Trip Destination (Thousands) - 1970 Weekday Person Trips

Trip Purpose To	Chicago Central Area		Chicago (Without Central Area)		Suburban(b) Illinois		Indiana(c)		Region	
	Trips	Percent	Trips	Percent	Trips	Percent	Trips	Percent	Trips	Percent
Home	115	11.8	2,422	46.5	4,619	43.6	748	40.7	7,904	42.4
Work(a)	519	53.0	895	17.2	1,151	10.9	205	11.1	2,770	14.9
Business Related To Work	64	6.6	170	3.3	294	2.8	52	2.8	580	3.1
Shop	60	6.1	500	9.6	1,538	14.5	226	12.3	2,324	12.5
School	39	4.0	142	2.7	432	4.1	65	3.5	678	3.6
Social/ Recrea-tional	94	9.7	629	12.0	1,458	13.7	379	20.6	2,560	13.8
Personal Business	76	7.8	310	6.0	730	6.9	108	5.9	1,224	6.6
Other	12	1.2	143	2.7	364	3.5	57	3.1	576	3.1
TOTAL	979	100.0	5,211	100.0	10,586	100.0	1,840	100.0	18,616	100.0

(a) Includes 145,000 walk-to-work and work-at-home trips.
(b) Includes 104,000 trips with destination outside the study area.
(c) Includes 11,000 trips with destination outside the study area.

TABLE 6
Percent of Trips by Trip Purpose and Household Income -
1970 Weekday Person Trips

Trip Purpose To	Annual Household Income				Total(a)
	\$6,000 or less	\$6,001- \$9,000	\$9,001- \$14,000	\$14,001 or more	
Percent	Percent	Percent	Percent	Percent	Percent
Home	42.4	43.3	42.5	41.7	42.4
Work(b)	13.5	17.1	15.0	13.8	14.9
Business Related To Work	1.3	1.9	2.8	4.5	3.1
Shop	13.6	12.3	13.3	12.1	12.5
School	2.7	3.1	3.5	3.8	3.6
Social- Recrea- tional	14.3	13.1	13.4	14.6	13.8
Personal Business	10.1	6.2	6.3	6.3	6.6
Other	2.1	3.0	3.2	3.2	3.1
TOTAL	100.0	100.0	100.0	100.0	100.0

(a) Includes trips for which income information was not reported.

(b) Includes walk-to-work and work-at-home trips.

of work travel during short periods, means that work trips have the major impact on most elements of the transportation system.

In contrast to work trips, shopping trips average only 3.0 miles in length, considerably less than the 5.1 mile regional average. Shopping trips represent 12.5 percent of all trips made, but generate only 7.3 percent of the total person-miles of travel. Social/recreational trips tend to be somewhat longer than the regional average with an average length of 5.7 miles, while personal business trips tend to be shorter, averaging 4.5 miles in length. Trips to home are 42.4 percent of the total trips made and produce 43.7 percent of total person-miles of travel. Their average length of 5.3 miles represents more or less of an average of the other trip purposes.

TABLE 7

Trips, Airline Person Miles of Travel (Thousands), and Average Airline
Trip Length (Miles), by Trip Purpose - 1970 Weekday Person Trips

Purpose To	Trips	Percent	Person- Miles	Percent	Average Trip Length (Miles)
Home	7,904	42.4	41,798	43.7	5.3
Work	2,770(a)	14.9	18,519(a)	19.4	7.0(b)
Business Related To Work	580	3.1	4,276	4.5	7.4
Shop	2,324	12.5	6,955	7.3	3.0
School	678	3.6	2,097	2.2	3.1
Social- Recrea- tional	2,560	13.8	14,560	15.2	5.7
Personal Business	1,224	6.6	5,486	5.7	4.5
Other	576	3.1	1,956	2.0	3.4
TOTAL	18,616	100.0	95,647	100.0	5.1

(a) Includes walk-to-work and work-at-home trips.

(b) Average trip length calculated with walk to work and work at home trips excluded.

PART IV. MODE OF TRAVEL

As noted in the introduction, data on modal usage have been expressed strictly in terms of priority mode of travel. Thus, the number of trips utilizing a particular mode is not necessarily the number which may have made use of that mode for some part of their journey. For example, the number of trips using bus as a priority mode is less than the total bus boardings, because of those trips that transfer to rapid transit and suburban railroad, which are higher priority modes. In the following, any use of the term "mode" infers priority mode of travel.

Several modes of travel were available to trip makers in the eight county study area. Table 8 lists the numbers of trips made by means of each priority mode defined in the home interview survey. Of the 18,616,000 trips made by the eight-county residents, 15,961,000, or 85.6 percent, were accomplished by private automobile; 1,711,000, or 9.2 percent, used some form of public mass transportation; 567,000, or 3.1 percent, were by school bus; and 377,000, or 2.1 percent, used other modes of transportation. Table 8 shows the relative importance of the various priority modes of travel in major portions of the region. In the Chicago Central Area, unlike most other areas, usage of transit is at parity with auto, with about 46.1 percent of all trips using some form of public mass transportation, i.e., suburban railroad, rapid transit, or public bus. Within the Chicago Central Area, the CBD (which in this analysis corresponds to ring zero and is bounded by Kinzie Street, the Chicago River, Harrison Street and Lake Michigan) is even more transit oriented with 60.0 percent of all trips gaining access by this mode. Outside of the Chicago Central Area the auto mode becomes dominant, and 77.9 percent of all trips occur by private auto, while 18.8 percent use public transit. Although the automobile is clearly the major mode of travel, transit usage in Chicago far exceeds that in any other area.

As Table 8 shows, only 2.3 percent of the trips destined to suburban Illinois, and only 1.4 percent of the trips with destination in northwestern Indiana, use public transit. However, in these areas usage of school buses becomes relatively significant, with a 4.5 percent level of usage in suburban Illinois and 3.5 percent in northwestern Indiana.

While overall transit usage is greatest inside the City of Chicago, certain areas outside Chicago which benefit from transit service exhibit significant levels of transit usage. Figure 13 shows the percent of trips by public transit by quarter square mile in the eight county study area, and that the percent usage is greatest in the City of Chicago, particularly along rapid transit routes. However, certain suburban areas in Illinois with local bus or suburban rail service appear with above average transit usage. In northwestern Indiana, the City of Gary experiences significant usage in a relatively wide area.

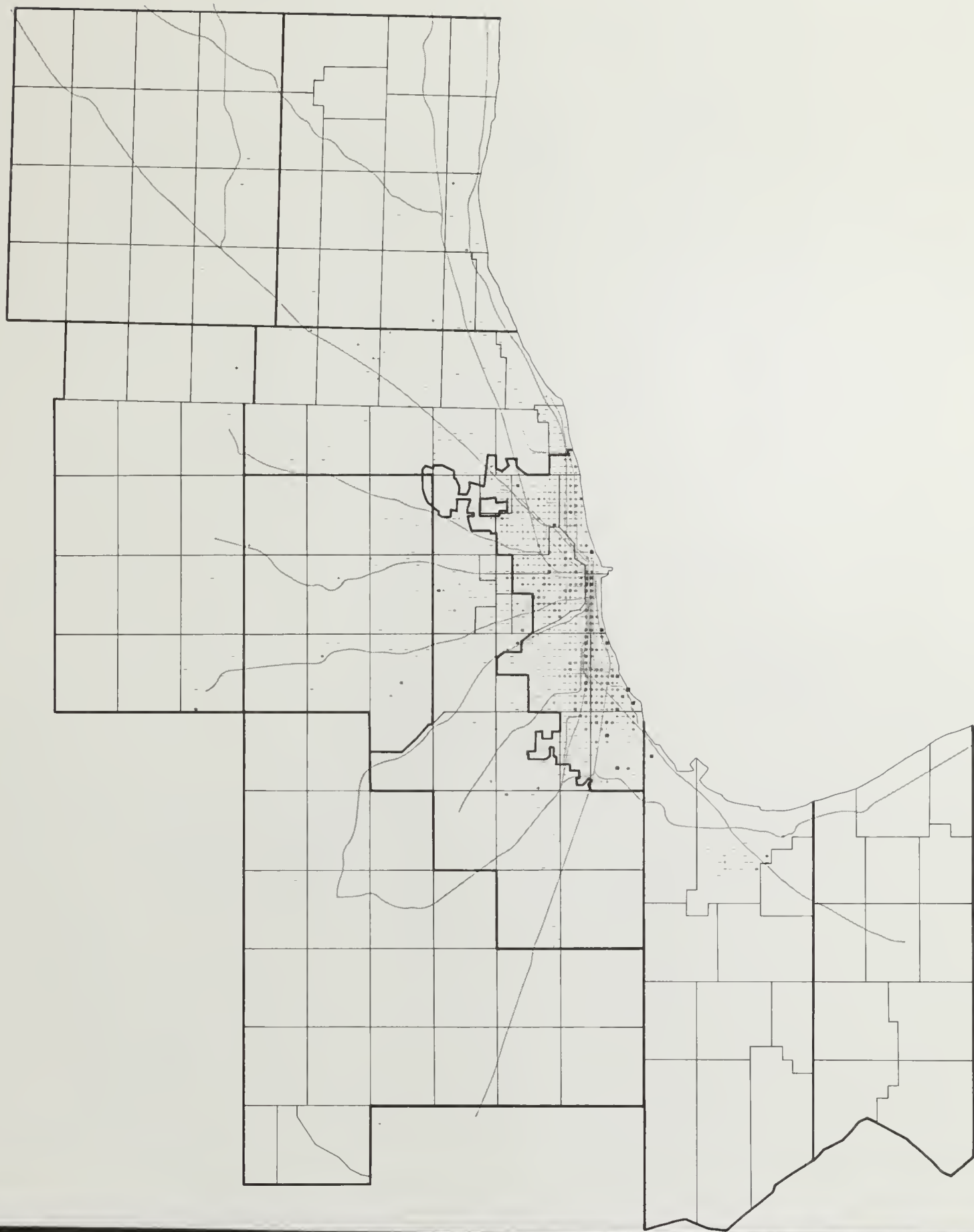
Although many trip makers in the study area find it advantageous to use mass transportation, the auto mode clearly dominates travel in the region. Figure 14 and Figure 15, which are, respectively, plots of auto driver and auto passenger trip destinations, show the great breadth and intensity of

TABLE 8

Trips by Priority Mode and Location of Trip Destination (Thousands)
- 1970 Weekday Person Trips

Priority Mode	Chicago Central Area				Chicago (Without Central Area)				Suburban Illinois(b)				Indiana(c)				Region	
	Trips		Per- cent		Trips		Per- cent		Trips		Per- cent		Trips		Per- cent			
Private Auto																		
Driver Passenger	310	31.6	2,771	53.2	6,707	63.4	1,150	62.5	10,938	58.7								
	110	11.2	1,285	24.7	3,039	28.6	589	31.9	5,023	26.9								
	420	42.8	4,056	77.9	9,746	92.0	1,739	94.4	15,961	85.6								
Public Transit																		
Suburban Railroad Rapid Transit Bus	105	10.7	35	.7	103	1.0	3	.2	246	1.3								
	194	19.8	256	4.9	52	.4	0	.0	502	2.7								
	153	15.6	689	13.2	98	.9	23	1.2	963	5.2								
	452	46.1	980	18.8	253	2.3	26	1.4	1,711	9.2								
Taxi Passenger	74	7.6	48	.9	22	.2	0	.0	144	.8								
School Bus	1	.1	30	.5	472	4.5	64	3.5	567	3.1								
Other (a)	32	3.4	97	1.9	93	1.0	11	.7	233	1.3								
<hr/>																		
TOTAL	979	100.0	5,211	100.0	10,586	100.0	1,840	100.0	18,616	100.0								

(a) Includes 145,000 walk-to-work and work-at-home trips.
(b) Includes 104,000 trips with destination outside study area.
(c) Includes 11,000 trips with destination outside study area.

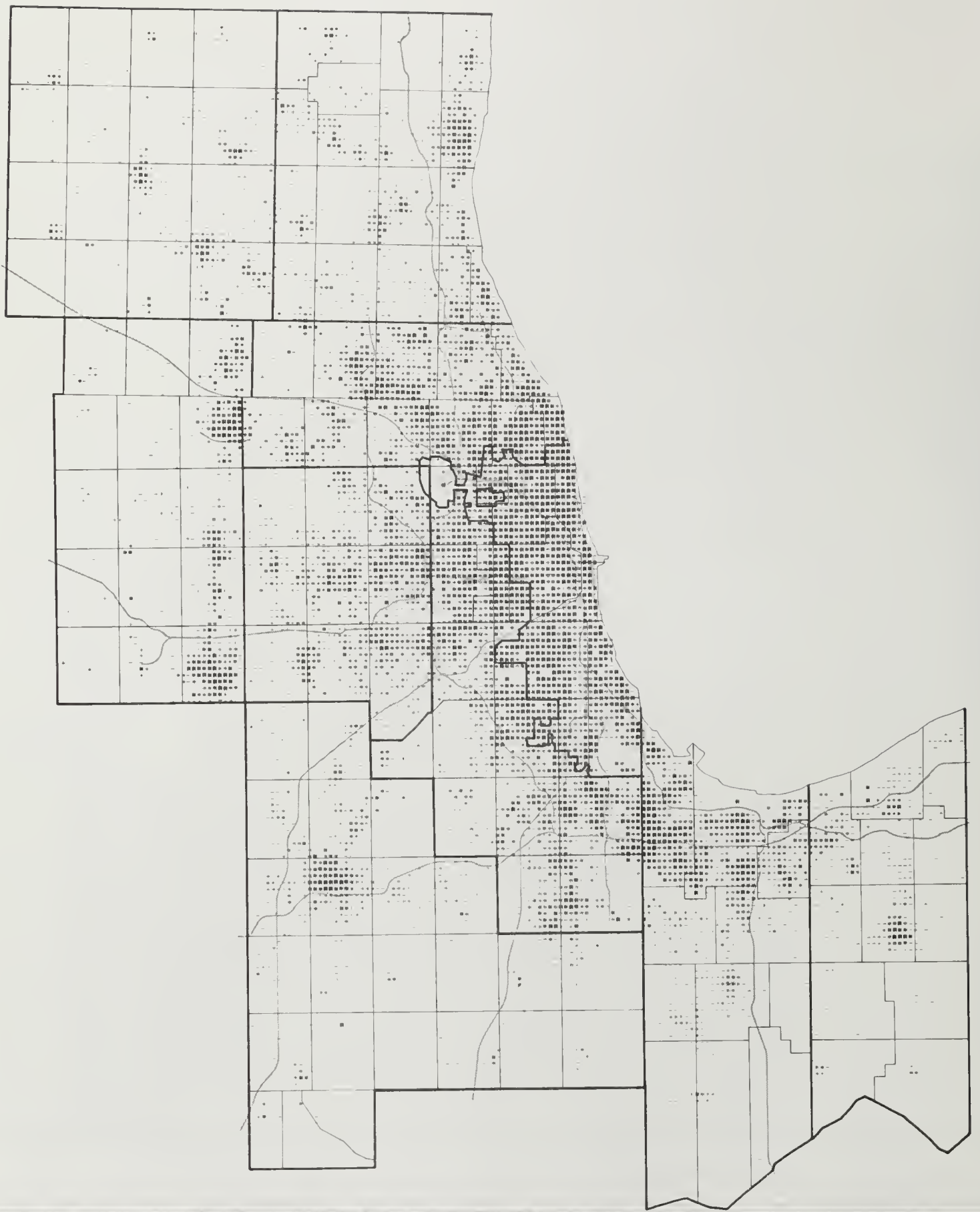


33

Percent/
Quarter Square Mile

- 0.0 to 9.9
- 10.0 to 19.9
- 20.0 to 29.9
- 30.0 to 39.9
- 40.0 to 49.9
- 50.0 to 59.9
- 75.0 and Over

Figure 13 PERCENT TRIPS DESTINATIONS BY PUBLIC TRANSIT
1970 WEEKDAY PERSON TRIPS

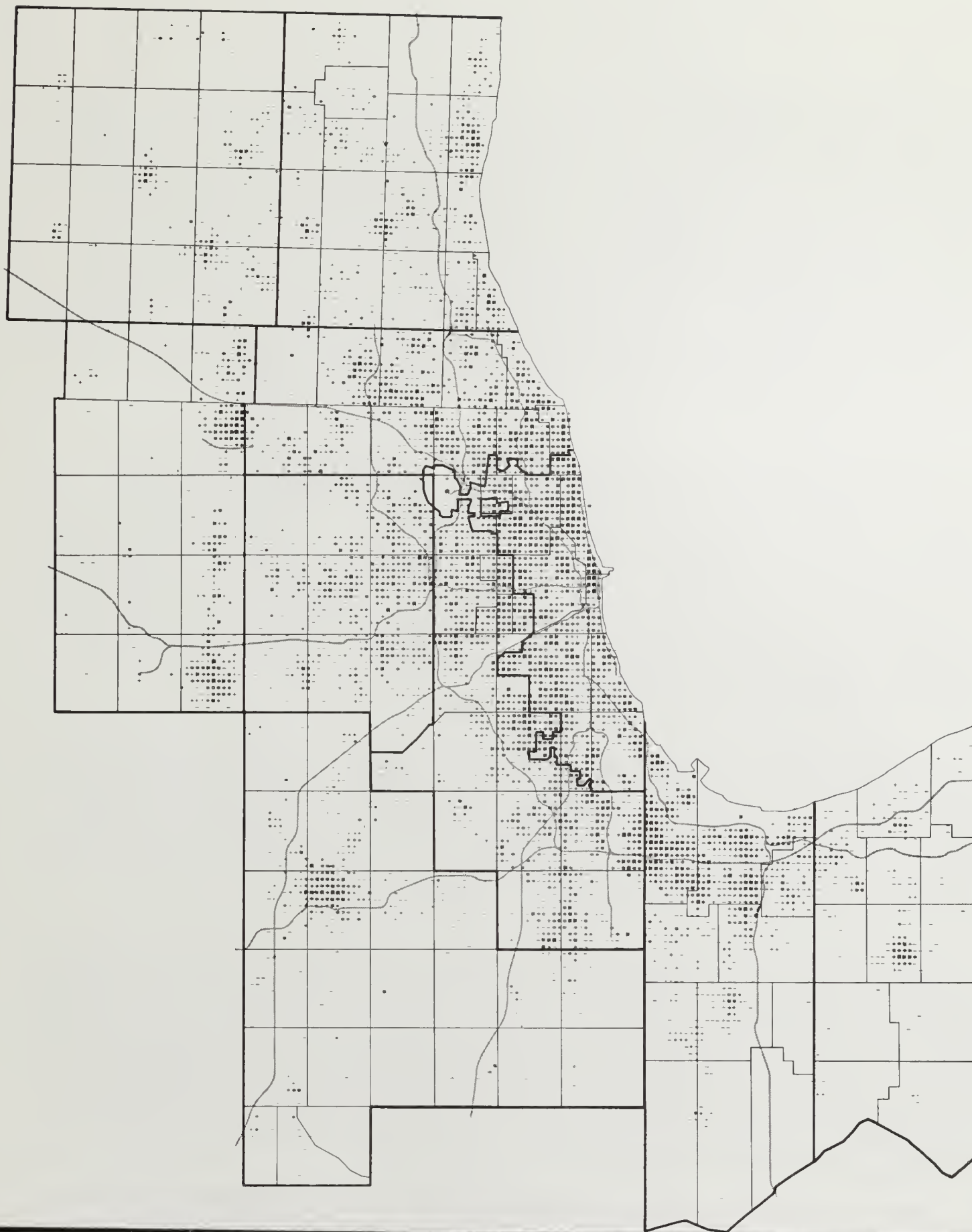


TRIP DESTINATIONS/
Quarter Square Mile

34

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure 14 AUTO DRIVER TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



35

TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure 15 AUTO PASSENGER TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS

auto travel in the study area. The usage of the automobile pervades the entire developed portion of the region. In contrast to the ubiquitous nature of auto travel, usage of suburban commuter railroad services are limited to very specific areas. As Figure 16 shows, suburban rail trip destinations are confined to the Chicago Central Area, to which 42.5 percent of all suburban rail trips are destined, and to corridors radiating from the Chicago Central Area into suburban areas. Trips using rapid transit are generally destined to locations within the City of Chicago, with the Chicago Central Area again acting as a focus. Approximately 38.7 percent of all rapid transit trips are destined to the Chicago Central Area. Figure 17 shows the concentration of rapid transit trip destinations in the Chicago Central Area, as well as high densities of trips along rapid transit routes.

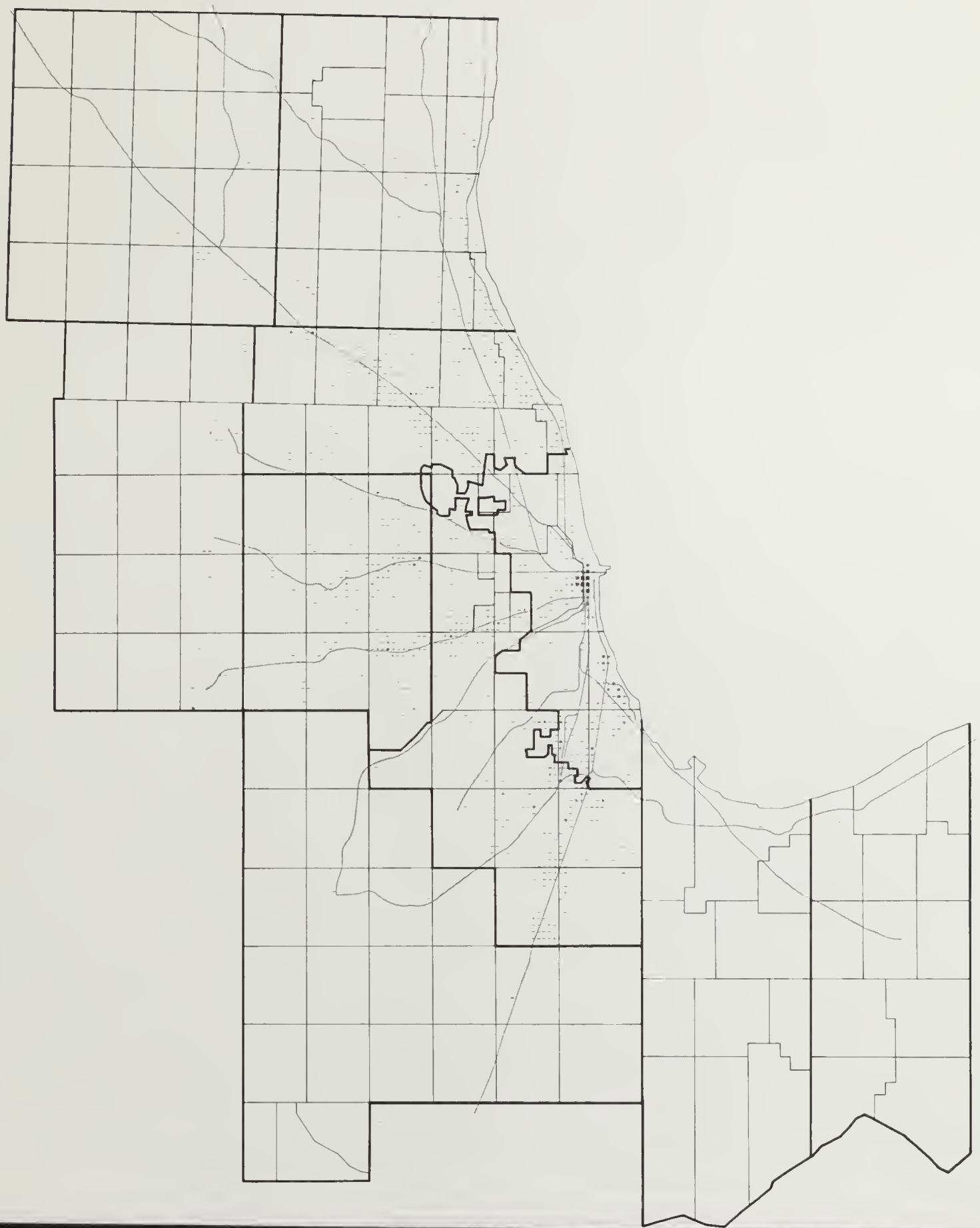
Of the public mass transportation modes, buses experience usage most comparable to that of the automobile, although at a much reduced scale. As Figure 18 shows, bus trip destinations cover most of the City of Chicago at a rather uniform density, much like the auto mode. The grid pattern of bus routes in Chicago provides good access to most areas and does not restrict the trip maker to service corridors. Nonetheless, the Chicago Central Area is a strong attractor of bus trips, with 15.9 percent of all bus trips ending there. While the vast majority of bus trips are confined to Chicago, some bus usage in the suburbs immediately adjacent to Chicago and in the satellite cities is also apparent in Figure 18.

A rather important, although overlooked, mode of travel is the school bus. School buses carry approximately 3.0 percent of the total daily trips in the region. This is greater than the number of trips using the entire rapid transit system each day. As Figure 19 shows, the pattern of school bus trip destinations is largely a reversal of that of public bus, with destinations spread throughout developed suburban areas.

Taxi trips, shown in Figure 20, are most highly concentrated in the Chicago Central Area. Considerable taxi usage also occurs in Chicago's South and West Sides, and along the north Lake Shore. Interestingly, taxi usage seems to be high both in low-income areas and in high-income areas with high rise residential structures. In low-income areas this is a manifestation of low levels of auto ownership, while in high-income/high rise area, it reflects the scarcity of auto storage facilities. Taxi trip concentrations also appear in the satellite cities.

Figure 21 shows the pattern of walk-to-work and work-at-home trip destinations. This was the only type of walking trip reported in the home interview survey and was surveyed primarily to establish an employment control total, which could be compared with other sources of employment data. As Figure 21 shows, most walk-to-work and work-at-home trips occur in the City of Chicago, with a particularly high concentration in the Chicago Central Area. These trips are not limited to Chicago, however, with significant levels appearing in many suburban areas and the satellite cities.

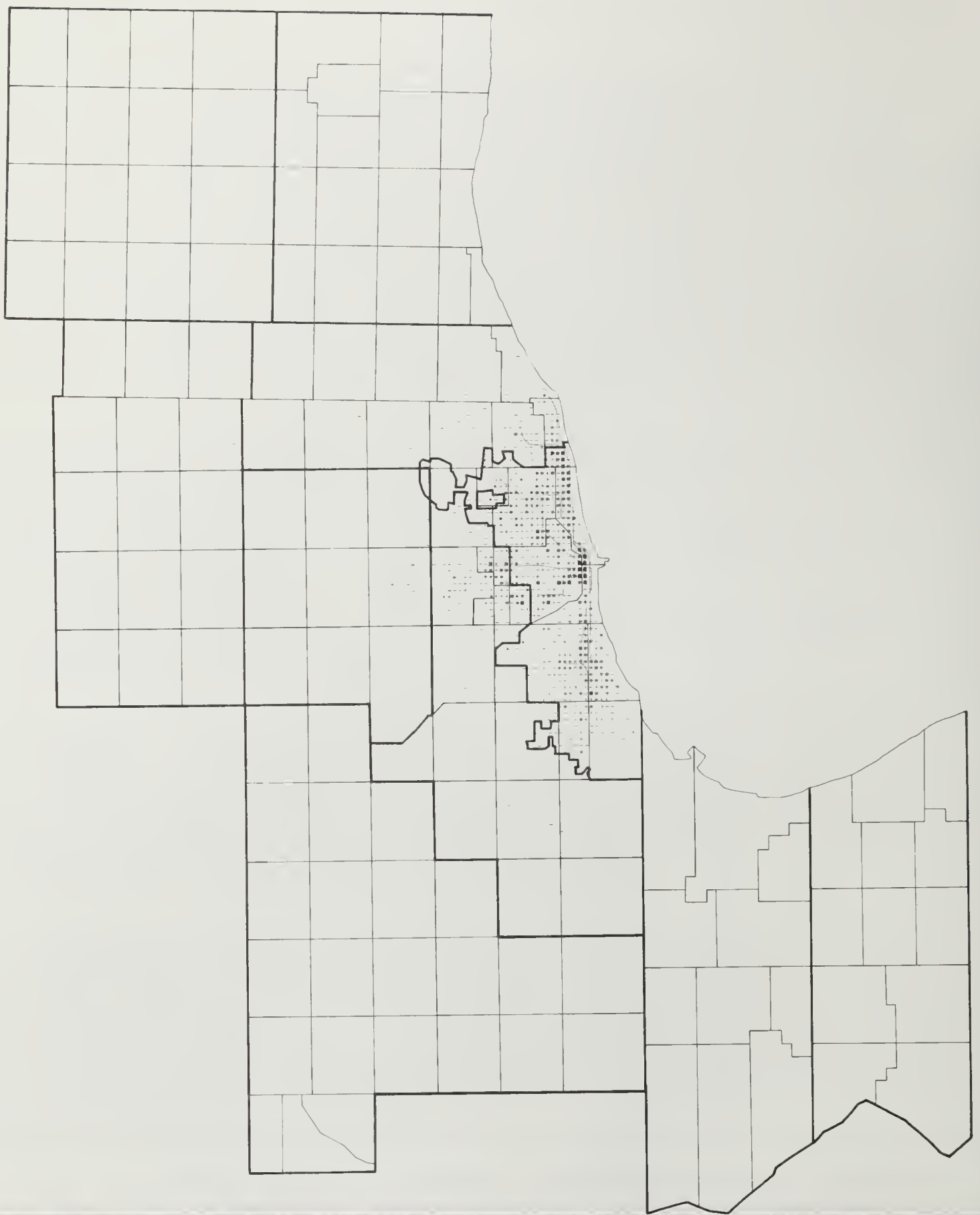
(Text continued on page 43.)



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

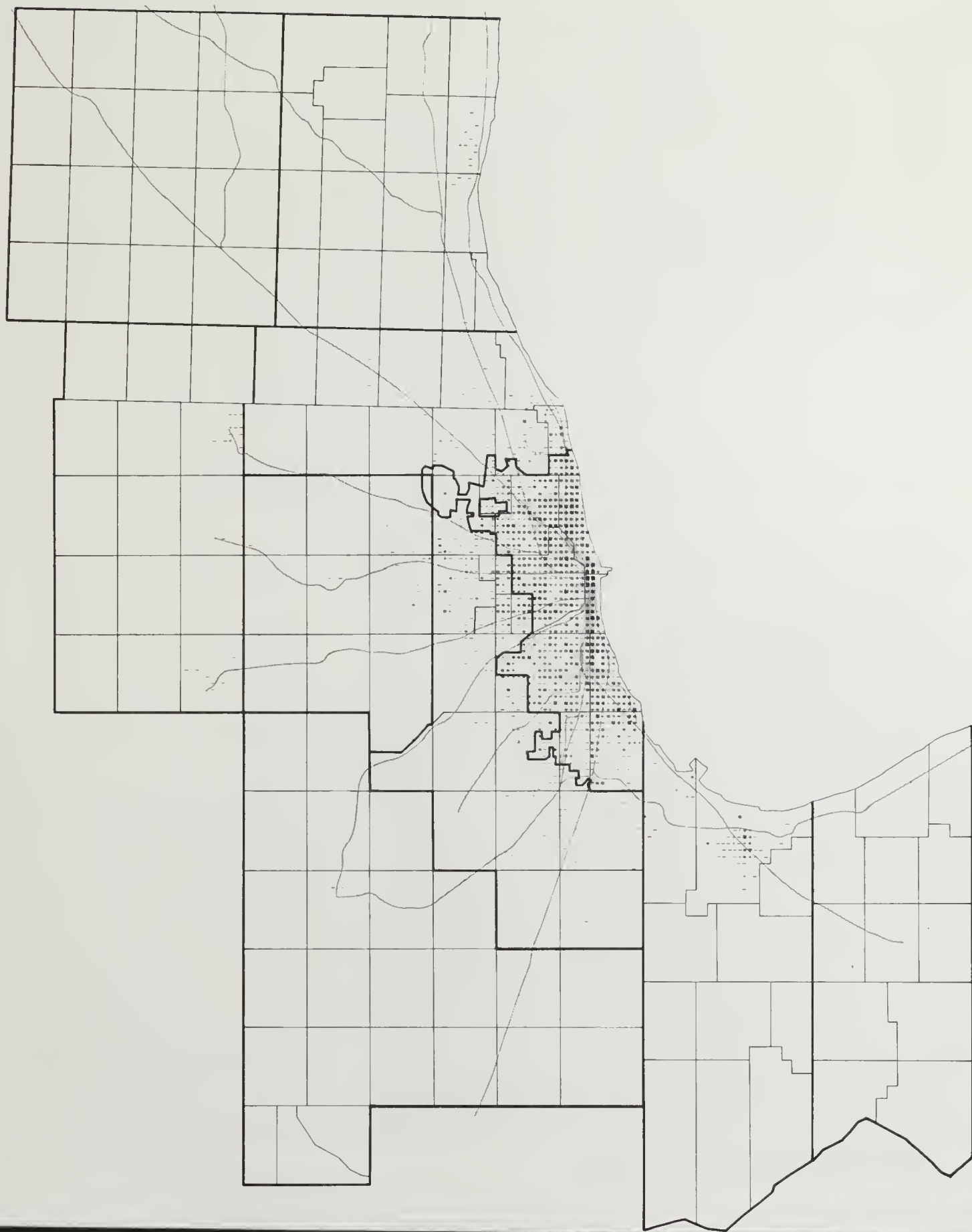
Figure 16 SUBURBAN RAILROAD TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

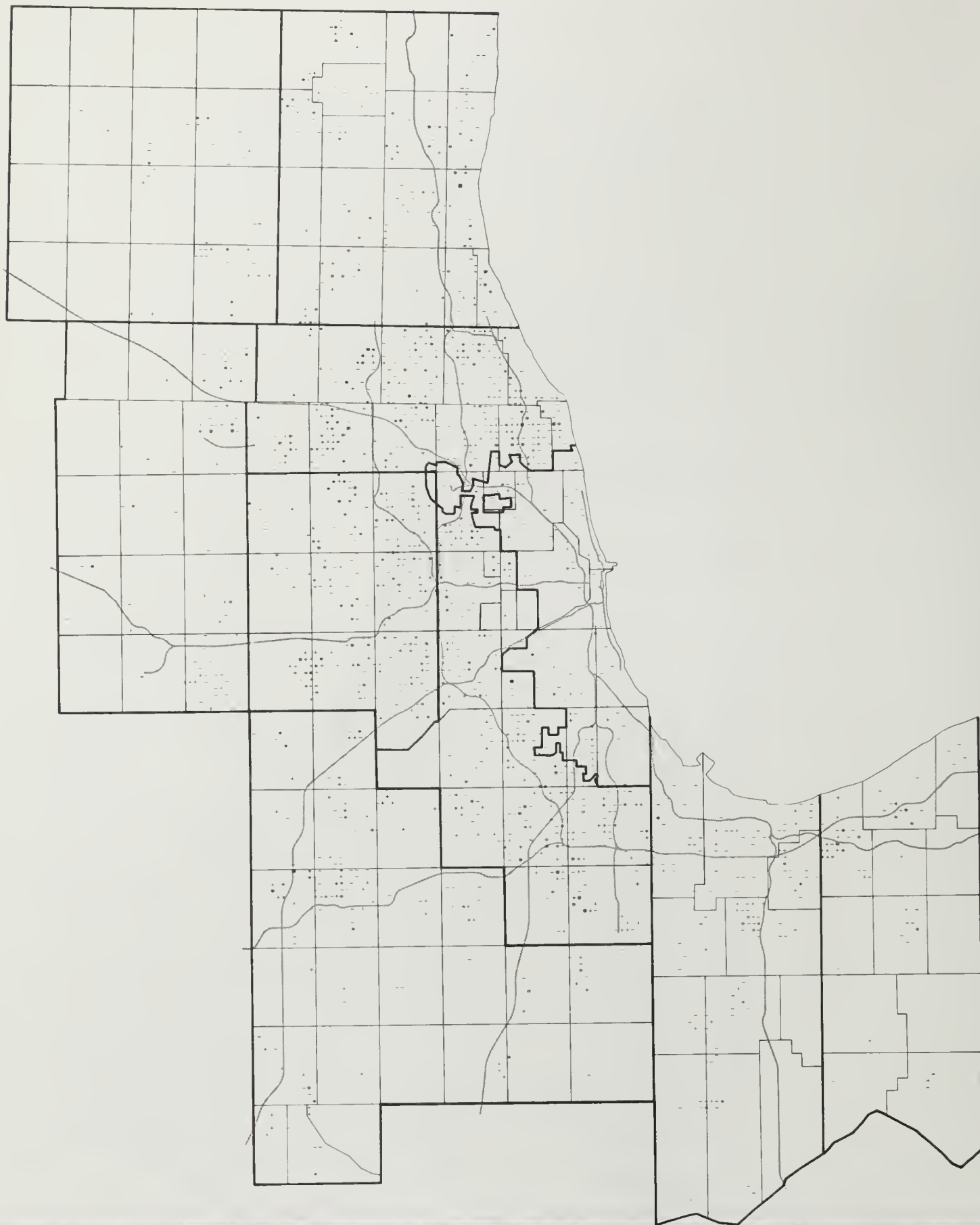
Figure 17 RAPID TRANSIT TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure 18 PUBLIC BUS TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS

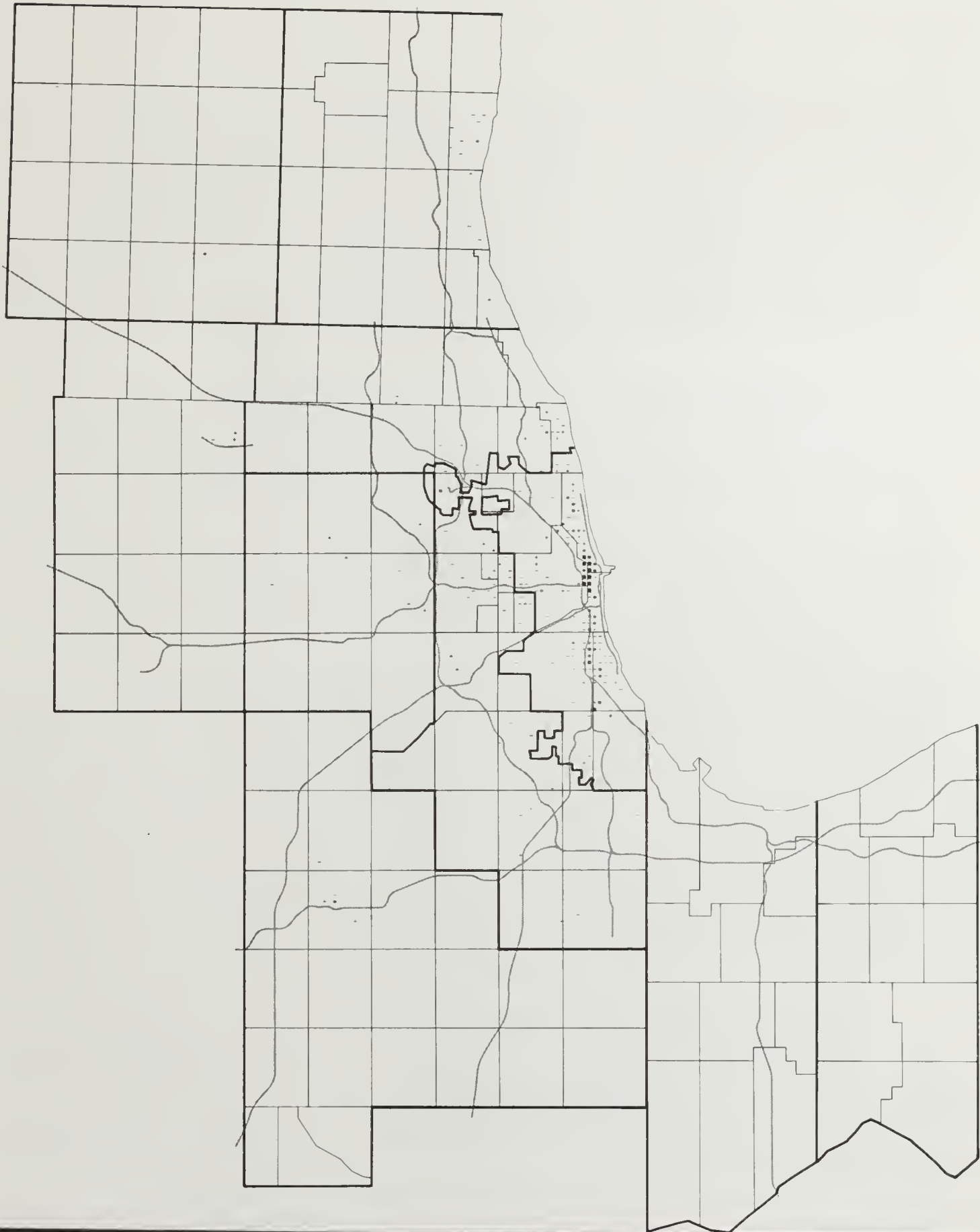


40

TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

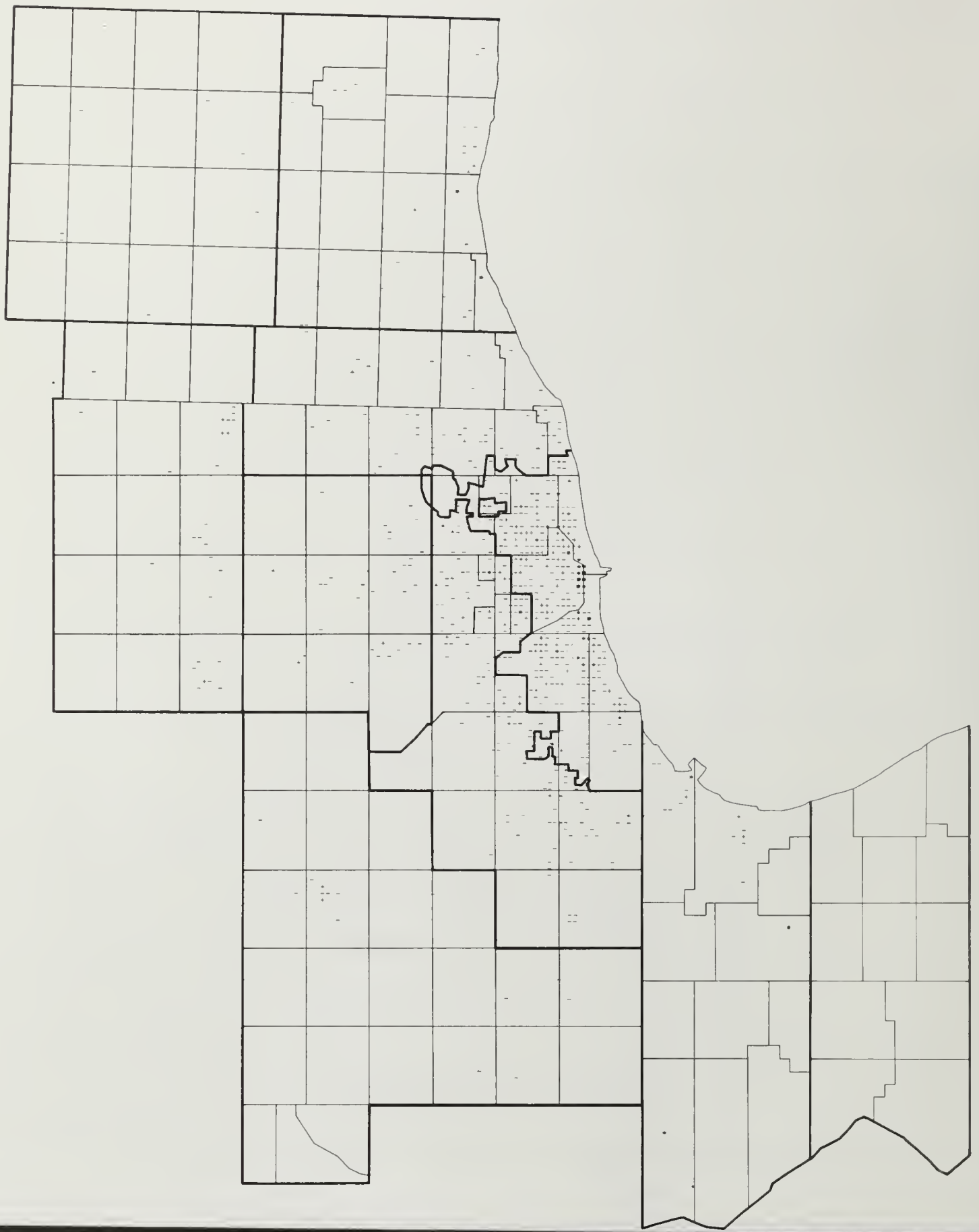
Figure 19 SCHOOL BUS TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure 20 TAXI TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS



42

TRIP DESTINATIONS/
Quarter Square Mile

- Under 100
- 100 to 249
- 250 to 499
- 500 to 999
- 1000 to 1999
- 2000 to 3999
- 4000 and Over

Figure 21 WALK-TO-WORK AND WORK-AT-HOME TRIP DESTINATIONS
1970 WEEKDAY PERSON TRIPS

In the preceding paragraph, it was determined that modal usage varied by location in the region. Similarly, mode of travel varies according to the purpose for which a trip is made. Table 9 cross classifies 1970 person trips by mode of travel and trip purpose. As Table 9 shows, the auto mode is dominant in almost all trip purposes. Of all trips made for the purposes of shopping, social/recreation, personal business, business related to work or other activities, 94.7 percent are made by auto. The level of auto usage drops to 74.3 percent for trips to work and to 49.2 percent for trips to school. Auto usage for trips to home largely represents an average for all purposes, with 84.8 percent being made by auto.

The public transit mode is utilized to the greatest extent for work trips. Over 19.0 percent of all trips to work make use of some form of mass transportation. The work orientation of transit usage is also exemplified by the fact that 58.3 percent of all trips on transit, excluding return trips to home, are to work, yet trips to work constitute only 25.8 percent of all non-home trips. Public transit usage is also relatively high for trips to school, with 13.8 percent of these trips using transit. Of course, the specialized mode of school bus carries a large portion, 36.8 percent, of the reported trips to school. For the remaining nonwork trips, excluding trips to school and home, transit is used only 3.9 percent of the time.

Two other important elements, of the many which affect mode of travel, are the paralleled factors of auto ownership and household income. Table 10 shows that as the household income of the trip maker increases, usage of public transit decreases. This trend appears throughout all trip purposes. For example, 32.6 percent of the work trips by individuals from households with 1970 annual income below \$6,000 were by public mass transit, while only 15.5 percent of work trips by individuals with household incomes over \$14,000 were by transit. The difference in usage of transit is even more pronounced for trips made for the purpose of shopping or social/recreational activities. About 12.5 percent of the shopping trips and 11.1 percent of the social/recreational trips from households with income under \$6,000 are made by public transit. This compares with 1.5 percent and 1.4 percent, respectively, for households with income over \$14,000.

The greater use of transit among lower income individuals is probably most directly related to levels of auto ownership. Table 11 shows how modal usage varies with cars per household. For households with no cars, 54.2 percent of all trips are made by public mass transit and 7.6 percent by taxi. Of those auto trips made by households with no car, 90.0 percent are as auto passengers. In households with one car, the level of transit usage drops radically to 8.8 percent, and only 32.9 percent of total auto trips are as auto passengers. As more autos are added to the household, these percentages decline still further, but not as sharply as the initial drop. It is interesting to note that the percentage of auto passenger trips is nearly constant for households with no car or one car. Thus, the major shift in mode of travel as additional autos become available is from mass transit and taxi to auto driver.

Although Table 11 showed that there was a much greater usage of transit in households which do not own cars, transit dependency is not limited to such families. Table 12 indicates that a substantial number of the transit

TABLE 9

Trips by Priority Mode and Trip Purpose (Thousands)

Mode	Purpose To							
	Home		Work		Business Re- lated to Work		Shop	
	Trips	Per- cent	Trips	Per- cent	Trips	Per- cent	Trips	Per- cent
Private Auto								
Driver	4,527	57.4	1,731	62.5	512	88.3	1,482	63.8
Passenger	2,159	27.4	327	11.8	29	5.0	749	32.3
	6,686	84.8	2,058	74.3	541	93.3	2,231	96.1
Public Transit								
Suburban Railroad	111	1.4	104	3.7	2	.3	7	.3
Rapid Transit	232	2.9	192	6.9	4	.7	18	.8
Bus	458	5.8	233	8.4	6	1.0	60	2.6
	801	9.1	529	19.0	12	2.0	85	3.7
School Bus	310	3.9	1	.0	0	.0	0	.0
Other ^(a)	107	1.2	182	6.7	27	4.7	8	.2
Total	7,904	100.0	2,770	100.0	580	100.0	2,324	100.0

(a) Includes 145,000 walk-to-work and work-at-home trips.

- 1970 Weekday Person Trips

School		Social-Recreational		Personal Business		Other		Total	
Trips	Per-cent	Trips	Per-cent	Trips	Per-cent	Trips	Per-cent	Trips	Per-cent
108	15.9	1,314	51.3	754	61.5	510	88.5	10,938	58.7
225	33.3	1,125	44.0	354	28.9	55	9.6	5,028	26.9
—	—	—	—	—	—	—	—	—	—
433	49.2	2,439	95.3	1,108	90.4	565	98.1	15,961	85.6
3	.4	6	.2	10	.8	3	.5	246	1.3
20	2.9	14	.5	17	1.4	5	.9	502	2.7
71	10.5	62	2.4	72	5.9	1	.2	963	5.2
—	—	—	—	—	—	—	—	—	—
94	13.8	82	3.1	99	7.1	9	1.6	1,711	9.2
249	36.8	7	.3	0	.0	0	.0	567	3.1
2	.2	32	1.3	17	1.5	2	.3	377	2.1
678	100.0	2,560	100.0	1,244	100.0	576	100.0	18,616	100.0

TABLE 10

Percent of Trips by Public Transit(a) by Trip Purpose and Household
Income - 1970 Weekday Person Trips

Trip Purpose To	Annual Household Income				Total(b)
	\$6,000 or Less	\$6,001 to \$9,000	\$9,001 to \$14,000	\$14,000 or More	
Home	23.4	13.4	8.2	6.5	10.1
Work(c)	32.6	23.5	16.6	15.5	19.1
Business Related To Work	9.5	2.8	1.8	1.4	2.1
Shop	12.5	4.5	2.5	1.5	3.6
School	34.8	21.4	11.9	8.8	14.1
Social/ Recreational	11.1	5.3	2.0	1.4	3.2
Personal Business	22.7	8.5	4.7	3.0	8.0
Other	6.9	.8	.7	1.9	1.6
TOTAL	21.3	12.3	7.4	5.9	9.2

(a) Percent of trips in each purpose group using public transit (suburban rail-road, rapid transit, public bus).

(b) Includes trips for which income information was not reported.

(c) Includes walk-to-work and work-at-home trips.

users in households which own autos are also "captive riders". (Captive riders were defined as that portion of the population that are non-drivers, or licensed drivers that lack the availability of an automobile during the time of the trip). Captive riders accounted for 70.0 percent of the transit trips made by one and two car households, and 46.0 percent of the trips made by households with three or more cars. Thus, the need for available transit system is not limited to households without automobiles. In addition to auto ownership, another important factor in the degree of transit captivity is the age group of the trip makers. Persons who are 65 years of age or older, and persons under the age of 16 tend to be more transit captive than other age groups because the majority of them fall into the nondriver category. A summary of transit trips by age group is shown in Table 13.

TABLE 11

Trips by Priority Mode and Auto Ownership per Household (Thousands)
- 1970 Weekday Person Trips

Priority Mode	0		1		Cars Per Household 2		3 or More		Total	
	Trips	Percent	Trips	Percent	Trips	Percent	Trips	Percent	Trips	Percent
Private Auto										
Driver	43	3.2	4,691	58.7	4,874	65.9	1,330	71.2	10,938	58.7
Passenger	386	28.4	2,275	28.5	1,922	26.0	440	23.6	5,023	26.9
	429	31.6	6,966	87.2	6,796	91.9	1,770	94.8	15,961	85.6
Public Transit										
Suburban Railroad	26	1.9	126	1.6	81	1.1	13	.7	246	1.3
Rapid Transit	206	15.2	228	2.8	57	.8	11	.6	502	2.7
Bus	503	37.1	354	4.4	97	1.3	9	.5	963	5.2
	735	54.2	708	8.8	235	3.2	33	1.8	1,711	9.2
Taxi Passenger	104	7.6	27	.3	12	.2	1	.0	144	.8
School Bus	15	1.1	194	2.4	302	4.1	56	3.1	567	3.1
Walk to work	39	2.8	59	.7	18	.2	4	.2	120	.7
Work at Home	6	.4	13	.2	5	.0	1	.0	25	.1
Other	32	2.3	37	.4	17	.2	2	.1	88	.5
TOTAL										
	1,360	100.0	8,004	100.0	7,385	100.0	1,867	100.0	18,616	100.0

TABLE 12

Captive Public Mass Transit(a) Trips by Auto Ownership per Household
(Thousands) - 1970 Weekday Person Trips

Autos/ Household	<u>Transit Trips</u>				Total Trips Percent		Total Trips (ALL MODES) Trips Percent	
	Captive Trips	Percent	Non-Captive Trips	Percent				
0	735	43.0	0	.0	735	52.2	1,360	7.3
1	527	41.3	181	59.6	708	37.4	8,004	43.0
2	131	13.8	104	34.2	235	9.3	7,385	39.7
3 or More	14	1.9	19	6.2	33	1.1	1,867	10.0
TOTAL	1,407	100.0	304	100.0	1,711	100.0	18,616	100.0

(a) Includes suburban railroad, rapid transit, and public bus priority modes.

TABLE 13

Public Mass Transit Trips(a) by Age Group of Trip Maker (Thousands)
- 1970 Weekday Person Trips

Age Group	<u>Transit Trips</u>				Total Trips Percent	
	Captive Trips	Percent	Non-Captive Trips	Percent		
Under 16	108	7.7	0	.0	108	6.3
16-19	180	12.8	10	3.3	190	11.2
20-24	193	13.7	38	12.5	231	13.5
25-29	128	9.1	36	11.9	164	9.6
30-34	93	6.6	36	11.9	129	7.5
35-44	179	12.7	54	17.8	233	13.6
45-54	222	15.9	64	20.8	286	16.8
55-64	170	12.0	48	15.8	218	12.7
65 or more	131	9.3	15	5.0	146	8.5
Unknown	3	.2	3	1.0	6	.3
TOTAL	1,407	100.0	304	100.0	1,711	100.0

Earlier it was observed that 85.6 percent of all trips used private automobiles for travel. Table 14 shows that in terms of person-miles of travel, the auto mode again dominates, with 84.6 percent of total person-miles of travel being accomplished by private automobile. The automobile is the major priority mode for all trip purposes and, accordingly, incorporates a broad cross section of trip lengths. Thus, the average length of a trip by auto is nearly the same as the overall average length of a trip in the region.

Unlike the varied usage of the automobile, certain public mass transit modes are primarily utilized for longer trips, reflecting high work trip usage. As Table 14 shows, 9.0 percent of total person-miles of travel are accomplished by rapid transit and suburban railroad, while only 4.0 percent of all trips use these modes. The average length of trips on rapid transit is 7.9 miles, compared to an average of 5.1 miles for all trips in the region. The suburban railroad mode is used for particularly long trips, with an average length of trip of 18.5 miles. In contrast, public bus accommodates the shorter trips made by transit users, serving trips with an average length of 3.9 miles.

The relative level of mass transit usage declined considerably from 1956 to 1970, as shown in Table 15. In 1956 survey tabulations, school bus and public bus trips were treated as a unit. For purposes of comparison, 1970 data have been similarly grouped in Table 15. In 1956 the transit mode was used for 24.3 percent of all trips, while in 1970 only 15.3 percent made use of this mode. The level of suburban railroad usage dropped from 2.5 percent of all trips in 1956, to 1.6 percent in 1970, and bus trips declined from 17.0 percent to 9.8 percent. Considering the suburban growth during this period and the accompanying increase in school bus use, the decline in total bus usage reflects a rather large loss of patronage in the public bus system. Similar to the other mass transit modes, the portion of trips using rapid transit declined, dropping from 4.8 percent in 1956 to 3.9 percent in 1970. Although the portion of total trips using rapid transit decreased, the absolute number of priority mode trips on this mode remained relatively stable. This occurred largely as a result of additions to the rapid transit system which increased total right-of-way mileage from about 70 miles in 1956 to 90 miles in 1970.

Table 16 shows the pattern of transit usage for trips by purpose 1956 and 1970, according to ring of trip destination. As may be observed, for work trips to the inner rings, transit usage remained somewhat more stable than for those destined to the outer rings. The rate of usage for work trips to the Chicago Central Area (rings zero and ring one) was only about 1.1 times higher in 1956 than in 1970. On the other hand, the rate of transit usage for work trips to points outside the Chicago Central Area was 1.9 times greater in 1956 than in 1970.

Unlike the pattern of change for trips to work, Table 16 shows that the usage of transit for trips to home tended to decline as much, and more, in the inner rings as in the outer ones. This pattern is a function of population losses in the inner rings and the occurrence of transit trips to home in the outer rings from places of work in the inner rings, where use

TABLE 14

Trips, Airline Person-Miles of Travel (Thousands) and Average Airline Trip Length (Miles) by Priority Mode - 1970 Weekday Person Trips

Priority Mode	Trips	Percent	Person-Miles(a)	Percent	Average Trip Length
Private Auto					
Driver	10,938	58.7	55,783	58.3	5.1
Passenger	5,023	26.9	25,165	26.3	5.0
	<u>15,961</u>	<u>85.6</u>	<u>80,948</u>	<u>84.6</u>	<u>5.0</u>
Public Transit					
Suburban Railroad	246	1.3	4,561	4.9	18.5
Rapid Transit	502	2.7	3,942	4.1	7.9
Bus	963	5.2	3,728	3.9	3.9
	<u>1,711</u>	<u>9.2</u>	<u>12,231</u>	<u>12.9</u>	<u>7.2</u>
School Bus	567	3.1	1,325	1.4	2.3
Other(b)	377	2.1	1,143	1.2	3.0
<hr/>					
TOTAL	18,616	100.0	95,647	100.0	5.1

(a) Where one mode acts as a feeder to another, the priority mode is credited with the entire trip. Thus, miles of travel and average trip length corresponds to the length of the entire journey, and not only that portion via the priority mode.

(b) Includes 145,000 walk-to-work and work-at-home trips.

of transit has continued to be relatively great, and from school via school bus. The effect of increased school bus usage is also evident in the use of transit for other nonwork trips to the outer rings. As noted earlier, the full effect of school bus usage cannot be quantified in 1956/1970 comparisons, but it was undoubtedly the major factor in the stable level of transit usage for nonwork trips to ring six and ring seven.

Table 17, compares rates of modal usage in 1956 and 1970 at a detailed level of trip purpose and priority mode. As observed above, the decline in the use of transit for trips to work and school generally was less than that

TABLE 15

Trips by Priority Mode (Thousands) - 1956 and 1970 Weekday Person Trips
(1956 Study Area Only)(a)

Priority Mode	1956		1970	
	Trips	Percent	Trips	Percent
Private Auto				
Driver	4,811	48.4	7,492	57.8
Passenger (b)	<u>2,706</u>	<u>27.3</u>	<u>3,482</u>	<u>26.9</u>
	7,517	75.7	10,974	84.7
Public Transit				
Suburban Railroad	246	2.5	213	1.6
Rapid Transit	479	4.8	501	3.9
Bus (c)	<u>1,686</u>	<u>17.0</u>	<u>1,262</u>	<u>9.8</u>
	2,411	24.3	1,976	15.3
TOTAL	9,931	100.0	12,950(d)	100.0

(a) Includes only trips with origin, destination, and residence inside the 1956 study area.

(b) Includes taxi passengers.

(c) Includes school bus trips.

(d) Excludes 102,000 walk-to-work trips, 19,000 work-at-home trips, and 71,000 trips with mode of other. These types of trips were not included in the 1956 survey tabulations.

for trips with other purposes. Use of transit for shopping trips decreased sharply from a level of 18.7 percent in 1956 to 4.9 percent in 1970. There was a major drop in bus usage for shopping, with only 3.5 percent of all shopping trips using this mode in 1970 compared to 14.0 percent in 1956. A steep decline in transit usage for social/recreational and personal business trips also occurred. The portion of social/recreational trips by transit decreased from 12.6 percent in 1956 to 5.2 percent in 1970, while the portion of personal business trips declined from 20.9 percent in 1956 to 11.2 percent in 1970.

Thus, the decline in the rate of transit usage from 1956 to 1970 occurred in varying degrees, depending on trip purpose, mode and destination, but

TABLE 16

Percent of Trips by Mass Transit(a) by Trip Purpose and Ring of Trip Destination - 1956 and 1970 Weekday Person Trips (1956 Study Area Only)(b)

Ring	Distance From Loop (Miles)	Trip Purpose To							
		Work		Home		Other Nonwork		Total	
		1956	1970	1956	1970	1956	1970	1956	1970
0	.0	78.6	68.9	34.2	12.0	61.6	51.6	71.3	61.9
1	2.0	48.5	41.0	47.8	29.7	34.0	26.5	44.6	34.7
2	4.0	33.5	27.0	42.3	36.3	28.2	21.6	36.2	29.3
3	6.0	30.7	22.7	37.1	30.3	22.8	20.3	31.2	25.7
4	8.5	22.6	15.5	29.2	23.9	16.6	10.6	23.5	18.0
5	12.0	13.6	8.5	17.2	13.2	9.0	6.3	13.5	9.7
6	16.0	7.7	3.4	12.5	9.2	6.1	5.0	9.3	6.6
7	23.0	4.7	1.1	10.2	10.2	5.0	6.9	7.4	7.9
TOTAL		33.7	21.9	26.1	16.9	16.8	11.3	24.3	15.3

(a) Transit modes include suburban railroad, rapid transit, public bus and school bus.

(b) Includes only trips with origin, destination, and residence inside the 1956 study area.

TABLE 17

Percent of Trips by Priority Mode and Trip Purpose - 1956 and 1970 Weekday Person Trips
(1956 Study Area Only) (a)

Purpose To	Priority Mode									
	Auto Driver		Auto Passenger (b)		Suburban Railroad		Rapid Transit		Bus (c)	
	1956	1970	1956	1970	1956	1970	1956	1970	1956	1970
Home	46.1	56.1	27.7	27.1	2.7	1.6	5.3	4.1	18.2	11.1
Work	55.6	66.3	11.8	11.8	5.0	3.9	8.2	8.2	19.4	9.8
Shop	54.0	62.4	27.3	32.7	1.3	.4	3.4	1.0	14.0	3.5
School	10.9	16.7	27.9	33.2	1.0	.4	5.2	4.5	55.0	44.2
Social/ Recreational	42.8	51.5	44.6	43.3	.7	.2	1.5	.9	10.4	4.1
Personal Business	50.1	59.4	29.0	29.4	1.3	1.0	3.1	1.9	16.5	8.3
Other	66.8	87.6	33.2	12.4	.0	.0	.0	.0	.0	.0
Total	48.4	57.8	27.3	26.9	2.5	1.6	4.8	3.9	17.0	9.8
									100.0	100.0

(a) Includes only trips with origin, destination and residence inside the 1956 study area.
 (b) Includes taxi passengers.
 (c) Includes school bus trips.

TABLE 18

1970 Auto Occupancy by Trip Purpose and Location of Trip Destination

Purpose To	Loop	Chicago (Without Loop)	Suburban Illinois	Indiana	Region
Home	1.95	1.49	1.46	1.51	1.48
Work	1.28	1.19	1.19	1.18	1.19
Business Related To work	1.06	1.08	1.05	1.05	1.06
Shop	2.09	1.58	1.49	1.41	1.51
School	1.27	2.22	3.70	3.00	3.01
Social/ Recreational	2.23	1.89	1.77	2.16	1.86
Personal Business	1.38	1.59	1.44	1.37	1.47
Other	1.00	1.15	1.11	1.04	1.11
TOTAL	1.38	1.45	1.45	1.51	1.45

TABLE 19

1956 and 1970 Auto Occupancy by Trip Purpose (1956 Study Area Only) (a)

Purpose To	1956	1970
Home	1.60	1.48
Work	1.21	1.18
Shop	1.51	1.52
School	3.55	2.93
Social/ Recreational	2.02	1.84
Personal Business	1.58	1.49
Other	1.50	1.14
TOTAL	1.57	1.47

(a) Includes only trips with origin, destination and residence inside the 1956 study area.

was common throughout the study area. The number of trips with a priority mode of transit in the 1956 study area declined by about 18.2 percent, and the rate of transit usage decreased by 37.1 percent. With most of the growth in the region occurring in suburban areas, which are generally removed from the existing transit system, new development primarily generated auto trips. At the same time, expanded and improved highway facilities made auto travel in established, formerly congested areas, a much more attractive alternative to transit. These factors, along with greater auto availability, were important in bringing about the observed decline in the level of transit usage.

An important topic closely related to mode of travel is the auto occupancy rate. Auto occupancy, which is defined as persons per-auto-vehicle trip, reflects the degree to which potential auto capacity is being utilized. The level of auto occupancy has a direct impact on traffic congestion, energy consumption and environmental pollution.

Average auto occupancy tends to decline with increasing income. For example, auto occupancy drops from 1.65 for trip makers with a 1970 household income of less than \$6,000, to 1.42 for those with a household income of over \$14,000. Auto occupancy also varies by trip purpose and location of trip destination, as illustrated by Table 18. With a rate of 1.19, trips to work tend to have low auto occupancy levels, while trips to school have the highest at 3.01. Social/recreational trips have the next highest occupancy rate, 1.86, followed by shopping trips, 1.51, and personal business trips with 1.47.

For most trip purposes, auto occupancy for trips to the Chicago CBD was higher than other areas in the region. Apparently, the high concentration of activities in the CBD, along with high parking costs, makes car pooling more attractive for motorists destined there than those destined to other areas of the region. Except for the CBD, there is no regular pattern of variation in auto occupancy by location of trip destination, although for many trip purposes there appear to be some tendency toward lower rates in suburban Illinois and Indiana compared to the City of Chicago.

The overall average auto occupancy rate decreased between 1956 and 1970. As Table 19 shows, the degree of change varied according to trip purpose. The occupancy rate for trips to work, which in 1956 was already quite low, changed only slightly, as did that for shopping trips. On the other hand, the rates for trips with purpose to school, personal business and social/recreational all declined rather significantly.

Taken together, trips of all purposes had an occupancy rate of 1.57 in 1956 compared to 1.47 in 1970. The general decline in occupancy levels portrayed by Table 19 reflects the increase in auto ownership and the diffusion of residential and employment sites in the region since 1956.

PART V. TRAVEL BY TIME OF DAY

One of the major problems in urban transportation is related to the time distribution of daily travel. A large portion of daily travel occurs during the morning and evening rush periods, with about 27.7 percent of all trips starting during four hours of the day between (7:00 a.m. to 9:00 a.m., 4:00 p.m. to 6:00 p.m.). Within the rush hours, large numbers of trips may occur in very short periods of time, and accumulate even further on certain transportation facilities.

The time distribution of trips by trip purpose is depicted in Figure 22. Although trips to work occur throughout the day, 65.2 percent originate during the period from 6:00 a.m. to 9:00 a.m. Most trips to school also originate during a short period of time, with 72.2 percent starting between 7:00 a.m. and 9:00 a.m. Together, trips to work and to school are the major elements of the morning rush period, constituting 79.5 percent of all trips originating between 7:00 a.m. and 9:00 a.m. Trips to home represent the major constituent of the evening rush period, largely reflecting the flux of trips to home from work, school and shopping. About 35.3 percent of all trips to home start between 3:00 p.m. and 6:00 p.m., accounting for 67.2 percent of all trips beginning during the evening rush period (4:00 p.m. to 6:00 p.m.).

Trips to home excluded, nonwork trip origins peak between 7:00 p.m. and 8:00 p.m. These nonwork trips represent 57.6 percent of the total trips beginning during the late evening period (7:00 p.m. to 9:00 p.m.). During the earlier parts of the day, nonwork trips are distributed rather uniformly compared to trips to work, school and home.

Together, trips of all purposes result in high concentrations of travel during certain periods of the day. The capacity of the transportation system is sized to accommodate these peaks, resulting in an over supply or underutilization of transportation network capacity during other parts of the day.

The peaking characteristic is common to all modes of transportation, but the intensity of the peaks varies by mode. Figure 23 depicts the distribution of trips by starting time and mode of travel. The work orientation of travel on the transit modes is reflected by the high peaks during the morning and evening rush periods on these modes, while the more general purpose usage of the auto is manifested by its less peaked distribution.

The suburban railroad mode has the most concentrated usage during the morning and evening peak period, with about 77.1 percent of all trips on this mode beginning during the four rush hours (7:00 a.m. to 9:00 a.m., to 6:00 p.m.). Rapid transit and public bus are also peak period oriented, with 56.5 percent and 40.8 percent, respectively, of their daily trips originating during these rush periods. Auto travel is the least rush-hour oriented, with 24.5 percent of all auto trips starting during the morning and evening peak periods. A significant peak in auto travel, particularly auto passengers, occurs from 7:00 p.m. to 9:00 p.m., with 20.3 percent of

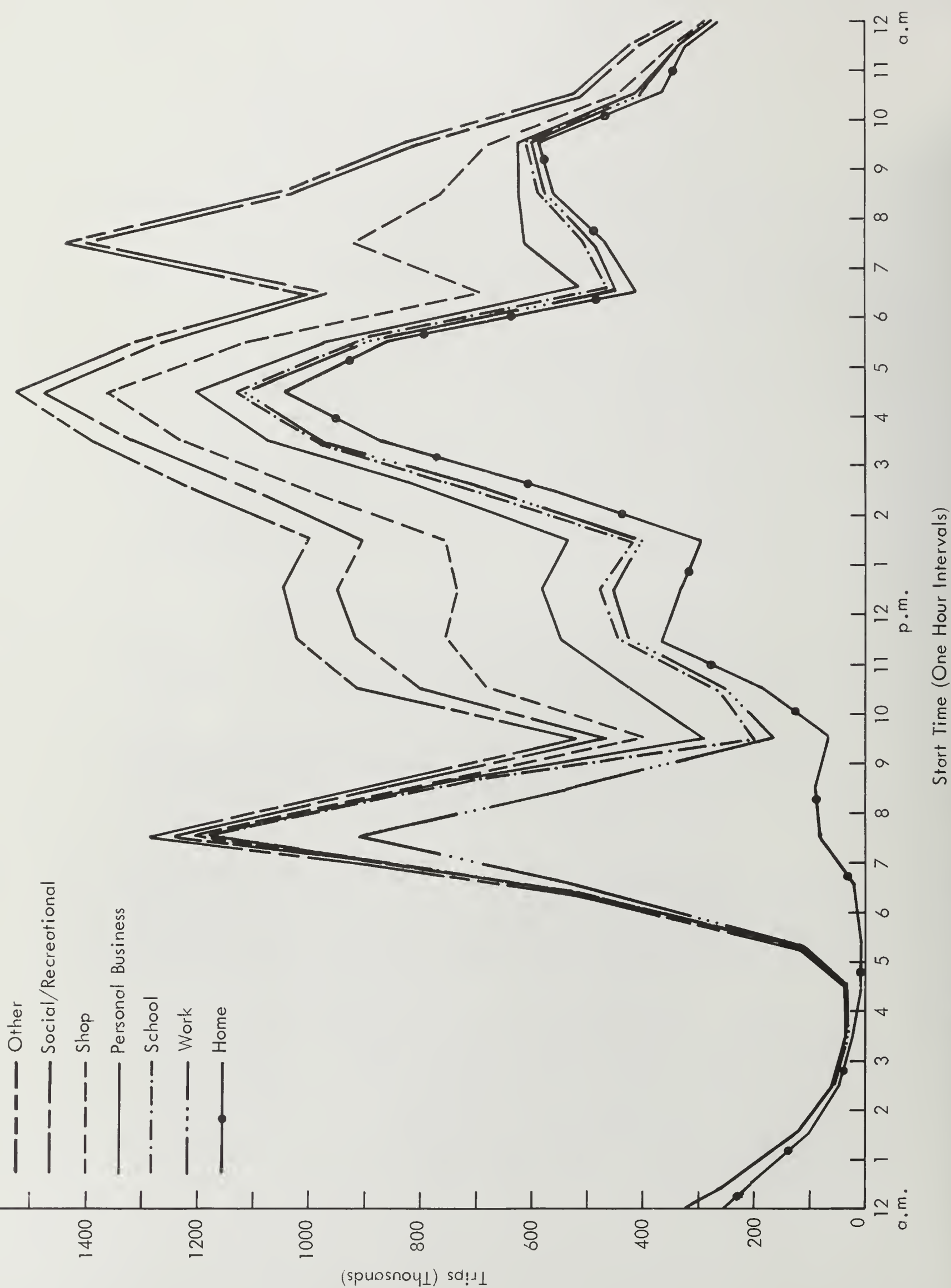


Figure 22 NUMBER OF TRIP ORIGINS BY TRIP PURPOSE AND TIME OF DAY - 1970 WEEKDAY PERSON TRIPS

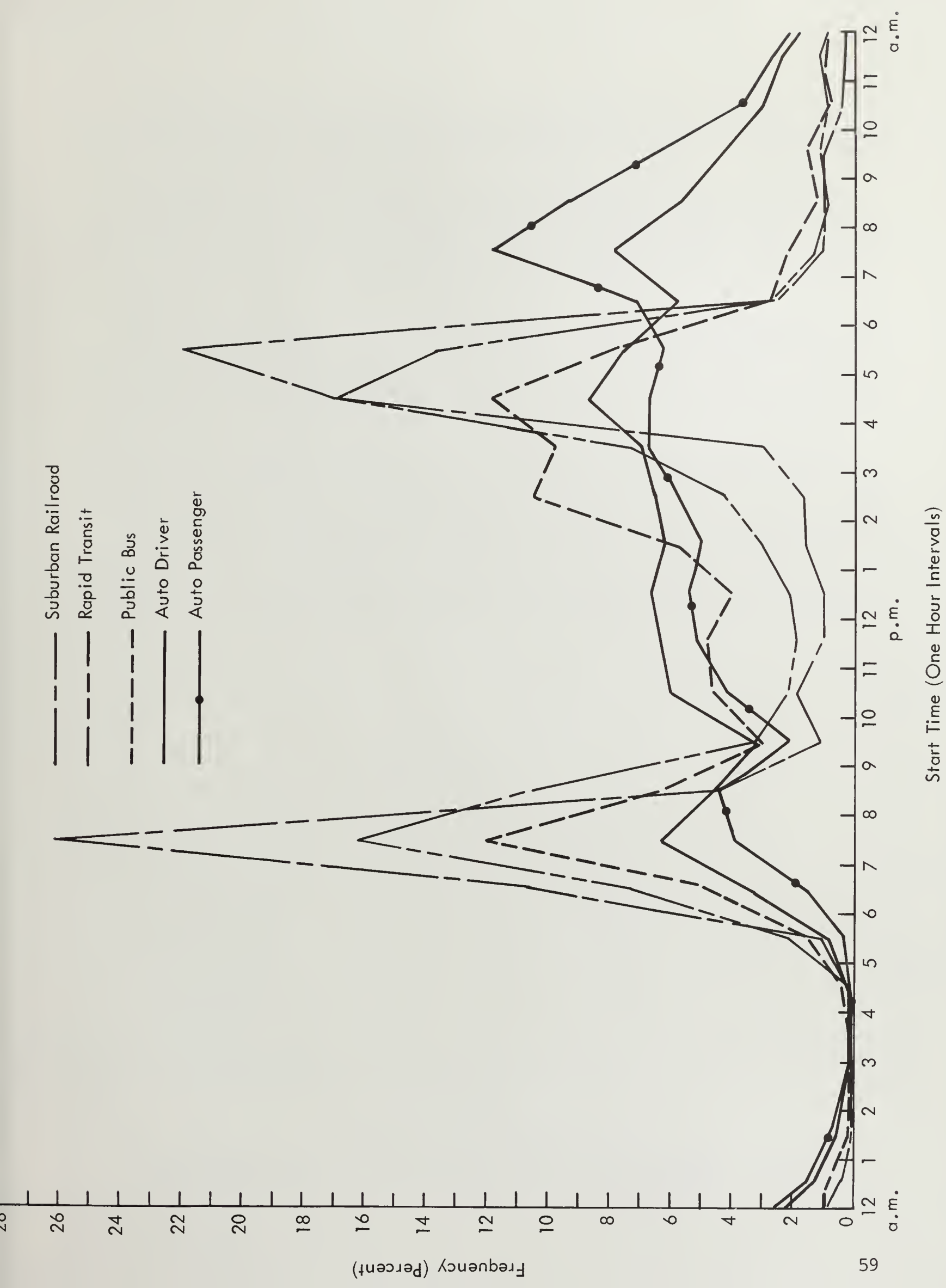


Figure 23. PERCENT EFFICIENCY DISTRIBUTION OF TRIP ORIGIN BY PRIORITY HOUR AND TIME OF DAY. TOTAL TRIP BY PRIORITY HOUR AND TIME OF DAY.

all auto passenger trips starting during this period. This corresponds to the late evening shopping and social/recreational travel peak observed previously.

Owing to the fact that individuals, once arriving at a particular destination, do not leave immediately, large numbers of people may accumulate in certain areas. The Chicago CBD is a prime example of such an area. This area daily collects very large numbers of people. Using a base level of 20,000 persons, which was estimated from information obtained from the Chicago Police Department and the Chicago Convention Bureau, Figure 24 depicts the build-up of people in the CBD to a maximum of about 325,000 individuals. This maximum is reached between 11:30 a.m. and 12 noon. By 9:30 a.m. about 85 percent of the total have already entered the CBD, while approximately 83 percent remain until 4:00 p.m. As Figure 24 shows, the rush to and the exodus from the CBD is very rapid, placing a great strain on the transportation system.

The time distribution of trip origins or destinations accounts for each trip at only one point in time (either starting time or arrival time). Perhaps a better measure of the temporal distribution of travel is trips in motion at any given time of the day. This distribution accounts for each trip during the entire time it is traveling over the transportation network.

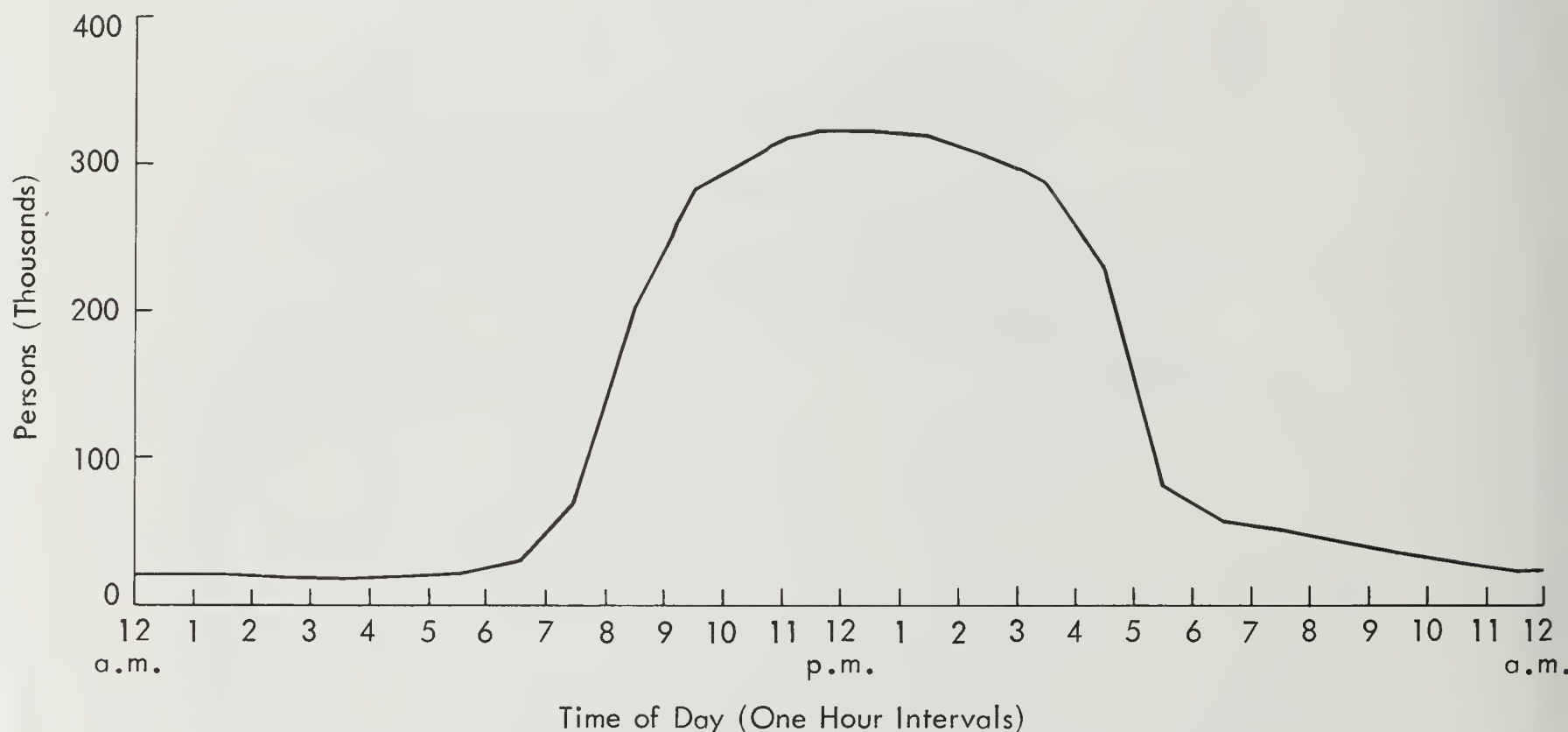


Figure 24 NUMBER OF INDIVIDUALS IN CHICAGO CBD BY TIME OF DAY
1970 WEEKDAY PERSON TRIPS

In order to develop this concept, the number of trips in motion during any part of each half hour of the day were plotted by one-hour intervals in Figure 25, along with trips originating during the same period. The shapes of the two distributions are essentially the same. However, the number of trips actually on the transportation system during any half hour period is roughly double the number starting, indicating any average trip duration on the order of 30 minutes. For example, during the period from 5:00 p.m. to 5:30 p.m., 822,000 trips began throughout the study area, while during some part of the same period, 1,486,000 trips are in motion over the transportation network.

The time distribution of trip arrivals throughout the day has changed to some degree since 1956. As shown in Figure 26, between 1956 and 1970 the relative importance of midday travel has increased, accompanied by somewhat less pronounced morning and evening peaks. This difference can largely be traced to the increased frequency of nonwork relative to work trips in 1970, which was noted in the discussion on purpose of travel. While in relative terms the peak periods in 1970 were not as prominent as in 1956, the absolute amount of travel occurring in the 1956 area during the peak periods, of course, increased from 1956 to 1970 by about 20 percent.

In addition to the increased frequency of midday travel, a peaking of travel after the evening rush period may also be observed in the 1970 data. This peak is not apparent in the 1956 distribution and reflects, in part, the increase of shopping and social/recreational activities during the evening hours, which has occurred since 1956.

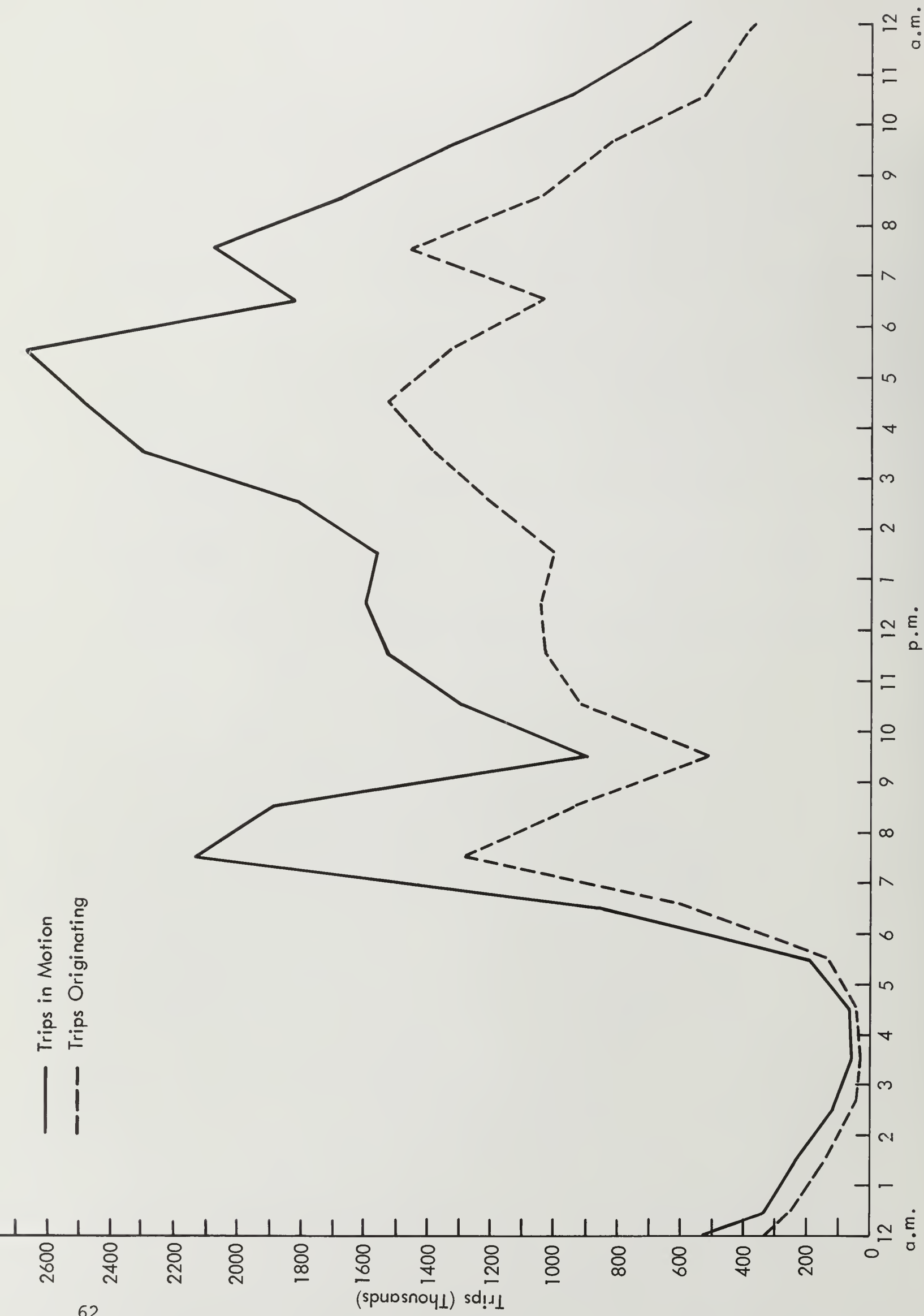


Figure 25 NUMBER OF TRIP ORIGINS AND TRIPS IN MOTION BY TIME OF DAY - 1970 WEEKDAY PERSON TRIPS

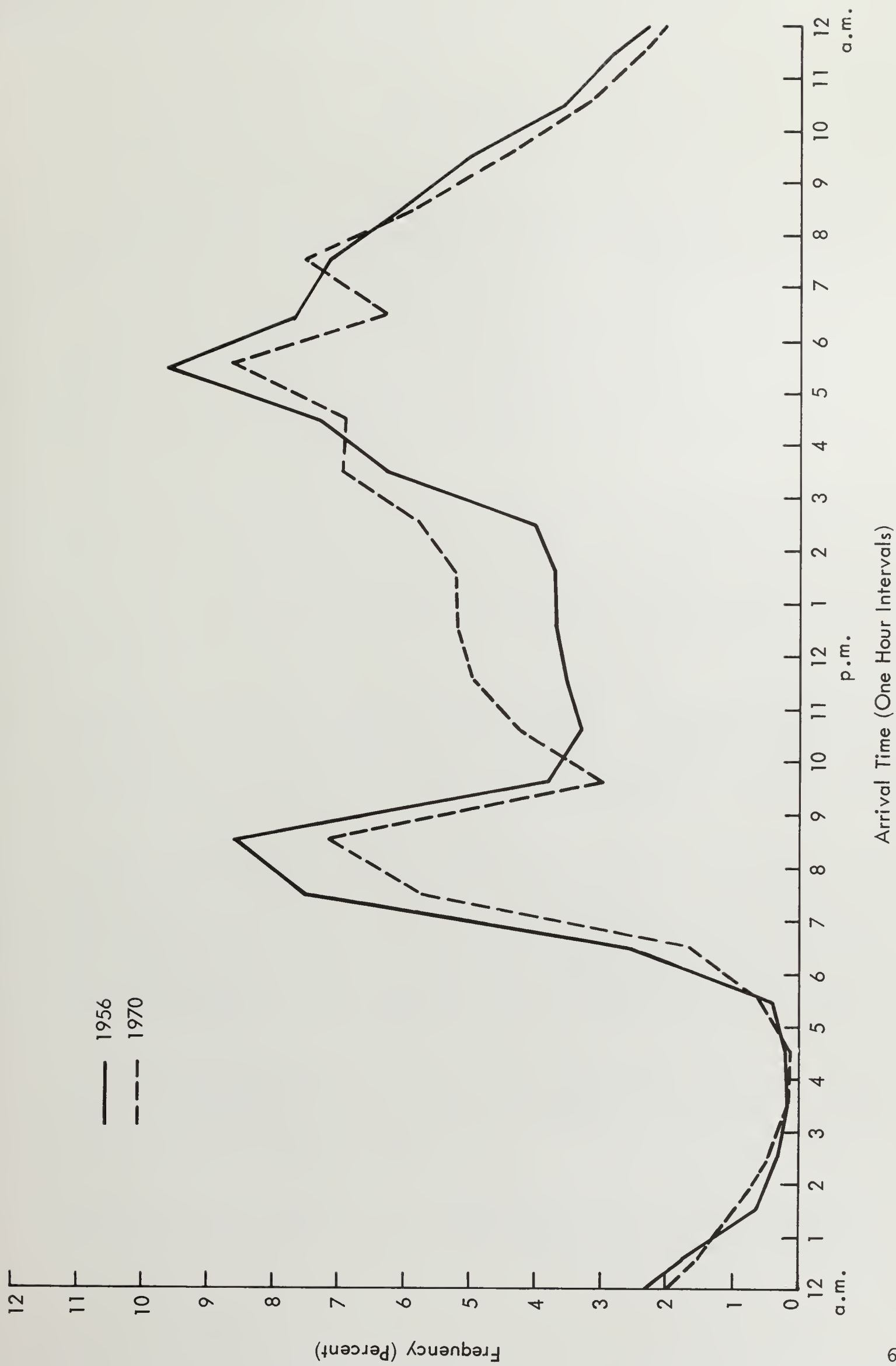


Figure 26 PERCENT FREQUENCY DISTRIBUTION OF TRIPS BY ARRIVAL TIME - 1956 AND 1970 WEEKDAY PERSON TRIPS
(1956 STUDY AREA ONLY)

VI. SUMMARY

Data obtained from the Chicago-Northwestern Indiana 1970/1971 home interview survey were analyzed, in order to measure certain basic characteristics of travel in the eight county study area. Specifically, the location, purpose, mode, and the time of occurrence of travel were investigated.

In summary, it was found that on the average weekday residents of the eight county study area made a total of 18,616,000 person trips, 6,190,000 of which ended in the City of Chicago, 10,482,000 in suburban Illinois, 1,829,000 in northwestern Indiana, and 115,000 outside the study area. In 1970, the number of trips occurring within the area surveyed in 1956 was about 30.5 percent greater than that observed in 1956, with most of the increase centered in suburban areas.

Trips with nonwork purposes, other than to home, increased proportionately more than trips to work between 1956 and 1970. Trips with nonwork purposes constituted 38.0 percent of the total in 1970 compared to 36.1 percent in 1956, while trips to work accounted for 18.5 percent in 1970 and 20.4 percent in 1956. The portion of trips to home remained constant. Among the nonwork trip purposes, shopping trips exhibited the greatest increase in relative frequency, while trips to for personal business decreased the most in importance.

From the 1970 data, it was observed that the amount of work travel decreased with increasing household income, except for households with very low income, which include large numbers of retirees or otherwise unemployed individuals. Work trips constituted a greater portion of the total trip destinations in Chicago than in other parts of the region, while the portion of social/recreational trips was greatest in northwestern Indiana.

The auto served as the dominant, all purpose mode throughout the region. In 1970, the eight county residents used private auto for 85.6 percent of all trips, public transit for 9.2 percent, school bus for 3.1 percent, and other modes for 2.1 percent. Public transit usage was oriented toward work travel to the Chicago Central Area, while school bus usage was greatest in the suburbs. The portion of trips by transit, including school bus, dropped from 24.3 percent in 1956 to 15.3 percent in 1970, with usage of transit for non-work travel decreasing more than that for work. Like mass transit usage, the auto occupancy rate declined from 1.57 in 1956 to 1.47 in 1970.

As observed in the 1956 survey, travel in 1970 peaked during the morning and evening work rush periods. However, in 1970 the peak periods were somewhat less pronounced, with midday travel increasing in importance. In addition, peaking of travel was observed to occur after the evening rush period in the 1970 data, but not in 1956.

Throughout the study of 1970 travel data and its comparison with 1956 observations, the effects of the growth of auto usage were highly apparent. The auto largely made the suburban life style possible and, with expanding

auto use, development in suburban areas mushroomed, as reflected by the observed jump in the importance of suburban trips. Likewise, the great convenience of the auto mode undoubtedly was a factor in the observed increase in the level of midday (nonwork) travel. The decline in auto occupancy can also be traced to greater auto availability. Of course, a direct consequence of increased auto use was the relative decline in travel on the mass transit modes. In general, then, it appears that the increased availability of the automobile, and the accompanying facilities to handle it, has had a major influence on the nature of urban travel.

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chicago area transportation study

The Chicago Area Transportation Study was organized late in 1955, sponsored and financed by the State of Illinois, Cook County, and the City of Chicago, in cooperation with the U. S. Bureau of Public Roads. The base study was completed and a recommended long-range highway and transit facilities plan for the Chicago Metropolitan Area was published in 1962.

Under the Federal-Aid Highway Act of 1962, the Study then undertook the comprehensive, continuing and cooperative transportation planning for the Chicago area.

In 1967, the Policy Committee expanded the area of CATS transportation planning responsibility to cover the six counties included in the Chicago Standard Metropolitan Statistical Area (Cook, DuPage, Kane, Lake, McHenry, and Will Counties). Transit interests were invited to participate at the Policy Committee level. Six commuter railroads (represented by one Policy Committee member), the Chicago Transit Authority, the Illinois State Toll Highway Authority, DuPage, Kane, Lake, McHenry, and Will Counties agreed to financially support the Study, and members from these agencies were added to the Policy Committee.

Policy Committee decisions are carried through by the Work Program Committee which includes representatives of the same broad spectrum of transportation interests. The more than 250 suburban municipalities within the Chicago area are organized into eleven Regional Councils.

The Rail Freight Committee, the Airport Managers Committee and the Transit Carriers Coordinating Committee provide functional assistance.

northwestern indiana regional planning commission

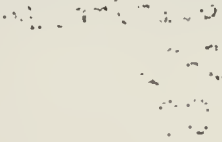
The Northwestern Indiana Regional Planning Commission (NIRPC) is the agency designated in conformance with Chapter 349, Act of 1965 and Chapter 281, Act of 1967, as amended, of the Indiana General Assembly to carry out the development of "... a comprehensive plan including a transportation ..." for the two-county, Lake and Porter Counties region. NIRPC is the legally constituted policy board in the northwestern Indiana SMSA, in the areawide planning organization, and the metropolitan planning organization for the northwestern Indiana region.

NIRPC consists of 25 commissioners appointed by member jurisdictions; 19 of the 25 members are elected officials as required by the regional planning act. The governor of Indiana appoints one member, 14 members are appointed by Lake County governmental units, and ten members by governmental jurisdictions in Porter County.

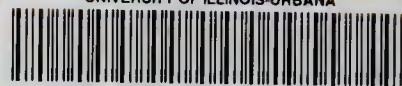
The commission operates within a committee and technical advisory committee structure. There are nine standing committees of the commission and numerous technical advisory committees. The Transportation Planning Committee consists of five NIRPC commissioners, the Indiana State Highway Commission, the Indiana Air Pollution Control Agency, the Federal Highway Administration, the Urban Mass Transit Administration and the Federal Aviation Administration. Technical advisory committee membership generally consists of commissioners, technical advisors, operators, and citizens.

The objectives of this planning agency, in addition to providing for the long-range needs of the northwestern Indiana region, are to provide the area with comprehensive planning programs as called for in the Federal Highway Act of 1962, as amended; the Urban Mass Transit Act of 1964, as amended; the Mass Transportation Act of 1970; the Housing Acts of 1954, 1961, 1965, and 1968; the Airport and Airways Development Act of 1970; the Rail Reorganization Act of 1973; Circular A-95, and other pertinent federal legislation requiring such comprehensive planning programs. NIRPC is authorized to carry out these programs by federal and state requirements.

The commission has completed major portions and elements of both short- and long-range planning and programming for land use, transportation, housing, open space, water and sewer, and other public services and utilities in Lake and Porter Counties.



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